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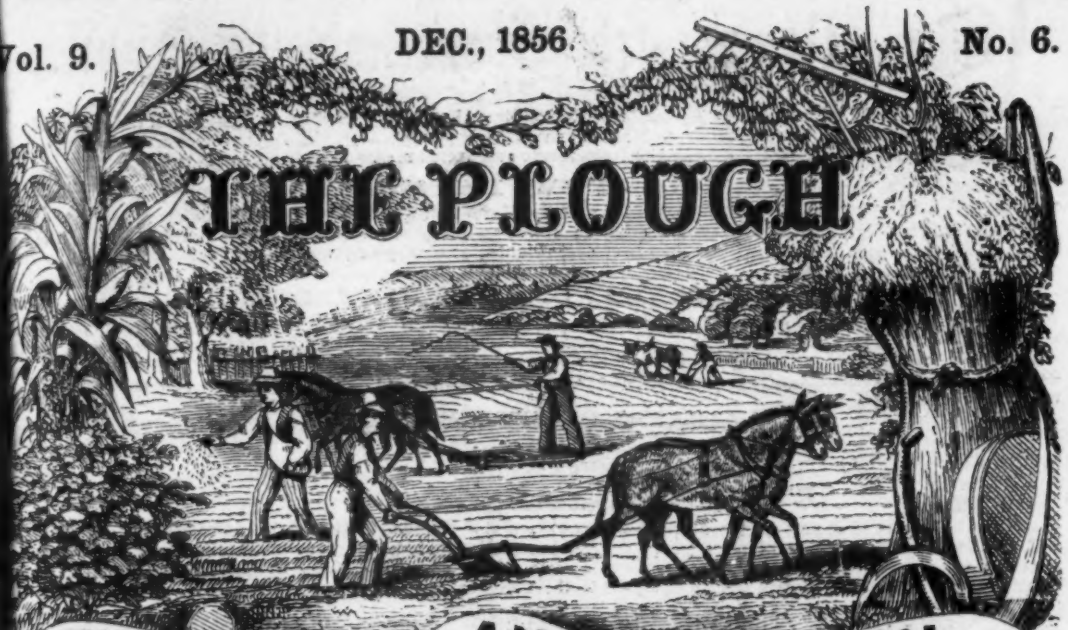
THE PLOUGH



THE LOOM AND THE ANVIL.

DEVOTED TO THE INDUSTRIAL ARTS:

AGRICULTURE, COMMERCE, AND MANUFACTURES.

J. A. NASH & M. P. PARISH, EDITORS.

NEW-YORK:
OFFICE, No. 7 BEEKMAN STREET, CORNER OF NASSAU.
1856.

The Plough, the Loom and the Anvil,

Is devoted to Scientific and Practical Agriculture, Horticulture, Fruit-growing, Breeds of Animals, the care of Cattle, Horses, Sheep, Swine, Poultry, Bees, &c.; to Manufactures, the Mechanic Arts, and Improvements in Machinery; and to Commerce and Mining, in their relations to Agriculture and Mechanics. It is pre-eminently

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The Plough, the Loom, and the Anvil.

VOL. IX. DECEMBER, 1856. No. 6.

Agricultural.

SOILS:—FORMATION OF—DETERIORATION—AMENDMENTS—CAPABILITY.

THE *mineral* condition of soil is due to the great geological transformations, which must have taken place mainly before the earth was inhabited by man or any of the present races of inferior animals.

Some portions, also, of the *organic* matter in soils are due to causes, almost, or quite, as remote. They are remnants of an older state of things. Witness, for instance, the coal formations, so extensive in this country and in Europe. The coal measures of England seem to have been formed under a condition of soil and atmosphere, in which ferns grew to the size of considerable trees; and the coprolites of that Island, now being ground up and used as manure, are but the excrements of enormous animals, which existed in other geological periods but are extinct in ours. It is not improbable that every portion of the earth's surface was impregnated more or less, from the very beginning of the present order of things, with the remains of animal and vegetable life previously existing. The world, as it now exists, was clearly made of old material—matter which previously existed in other forms.

The richness of virgin soils in organic matter is to be accounted for mainly by the growth and perishing of forests, and in some small part by the perishing of animals and insects on its surface, while in the forest state. Forests, and their countless tenants, seem to have been the divinely appointed predecessors of man in preparing the earth for a high cultivation. The trees were destined to draw the carbon from the air and deposit it in the soil; fish-devouring birds, to gather phosphates from the sea and scatter them over the land; and all that lived, to die, and enrich the earth with their blood and flesh and bones. Thus prepared by these predecessors—plants and animals—our remoter forefathers found Great Britain, and our late ancestors, this country.

A higher cultivation commences. The trees fall; the rubbish is burnt from the surface; the ashes are left on the soil; the seed is put in; the crops grow luxuriantly, for there is plenty of inorganic matter;

the grain ripens heavily, because the needed mineral ingredients are all there. But what *are* the ingredients of which this virgin soil consists? The specimen which we select for an analysis may contain 90 per cent of silica (sand); 2 of alumina (the basis of clay); $1\frac{3}{4}$ of oxide of iron (a sort of iron rust); $\frac{1}{4}$ of oxide of manganese (the rust of a metal resembling iron); 1 of lime; $\frac{1}{2}$ of magnesia; $\frac{1}{4}$ of potash; $\frac{1}{4}$ of soda; 1-8 of phosphoric acid; 1-16 of sulphuric acid; 1-16 of chloride of sodium (common salt); and the rest, making some three or four per cent of the whole, is organic matter, mostly of vegetable, but in some small part, of animal origin. If such should be the result of the analysis, we see that of 100 lbs. of this soil, 90 lbs are sand, 2 lbs. alumina, $1\frac{1}{2}$ lbs. oxide of iron, $\frac{1}{4}$ lb. oxide of manganese, and so on; and we see that several ingredients which are important to the success of crops, exist in very small proportions. They are quite sufficient to promote the growth of forests perpetually, if the leaves, and eventually the trees themselves, are left to perish on the soil. So it would be with the esculent roots and the cereals. They might grow long on this soil, if they were to be plowed into it each year, instead of being removed. But if the crop were to be carried off and nothing returned in its place, $\frac{1}{4}$ of a lb. of potash, in 100 lbs. of soil, would not suffice for many crops of potatoes; nor 1-8 of a lb. of phosphoric acid for many of wheat; nor 1-16 of a lb. of sulphuric acid for many of corn. If either of these crops were cultivated for successive years, the land would be deprived of the favorite, rather of the essential ingredient, for that crop. Or, if the land were to be pastured by milch cows, yarded at the barn, the result would be similar. The phosphoric acid, carried off in the form of phosphate of lime, in the milk and in the yard manure, would soon be exhausted. This shows how lands *may be deteriorated.* It is by carrying off in the crop ingredients of which they have none to spare. It shows also the advantage of rotation in crops. Suppose a field to possess in abundance all the requisites of fertility except phosphoric acid, sulphuric acid, and potash. If it has but a little of each of these, it is evident that, if you were to grow wheat upon it year after year, you would soon exhaust it of the first; if you were to grow corn crops in succession, you would exhaust it of the second; and if you were to grow potatoes, you would very soon exhaust it of the third. But if you were to grow one wheat crop, one corn crop, one potato crop, and to pasture it two years in five, you would then draw more equally upon the scanty ingredients; and the land would not so soon be exhausted of any one of them; and while pasturing it two years, you would allow it to be accumulating organic matter. It is true, that if land is highly manured with barn manure, which contains all the ingredients of the crop, it will bear the same crop perpetually. But with lands which cannot

be highly manured, the more varied the crop, the longer will the land continue to produce; and there cannot be much doubt, that the most highly manured lands even, will give a greater value of several crops than of any one, though it appears that some, who ought to know, are beginning to dispute this, especially with regard to particular crops, as onions for instance; and we are inclined to believe there may be exceptions, of which the onion crop may be one.

With regard to *amendments*, if it were possible to obtain accurate analyses of all our soils, at a moderate expense, so as to settle the question what ingredients are deficient and what are not, manifestly we could amend them at a cheaper rate than to apply manures which contain all the wants of our crops, as is the case with barn manure. You might wish to grow on a piece of land a succession, of corn the first year, clover with oats or barley the second, clover the third, and wheat the fourth. The analysist might tell you, that with the barn manure which you intend to apply to the corn crop, there is enough of everything required for these crops except one; and you might supply that one by means of a special manure at a cheaper rate than by putting on great quantities of barn manure. Suppose the missing ingredient were phosphoric acid. He might tell you that there is more of this ingredient in one dollar's worth of bone dust than in ten dollars' worth of your barn manure; and so for all present purposes you may supply for one dollar the place of what is worth ten dollars for other parts of your farm. But we are not yet prepared to advise farmers to procure analyses of their soil, except in case of large extents of land all of a similar character. For small extents, and especially where the soil varies every few rods, it will not pay. Should the time come when the analysist can tell the farmer with anything like certainty, what is the best and the cheapest application for this or that soil, with due reference to the desired crops, and when the information can be communicated at an expense which the farmer can conveniently pay, of all which we do not despair, it will be a new era in the affairs of the farm, and we shall rejoice in it. But that time has not yet come.

At present, the farmer should read, think, inquire; should observe carefully the results of his own and others' doings; and after all, must be contented, for aught we can see, to work on without being absolutely certain whether what he is doing, in each case, is the best that could be done. Guided by the best judgment which his experience and observation enable him to form, we see not but that he must undertake the amendment of his soils in more expensive, and consequently less profitable ways than might be necessary if more were known on the subject. It may be said that soils are to be amended in two respects, *physically and chemically*. These, however, cannot

be regarded as wholly distinct operations; for it often happens that what betters the physical condition of a soil, improves it chemically, and the reverse. Soils which contain standing water, for any considerable portion of the year, within thirty-six inches of the surface, should be under-drained. The operation is laborious, but then the labor will be better paid than that expended in the cultivation of these without draining. As the water is drawn off, the air permeates the soil; it becomes warmer, because less evaporation takes place from the surface; inert vegetable matter is decomposed, and becomes food for plants; physical and chemical changes go on conjointly, as the result of the same cause, that of drawing off the water and letting in the air.

If land is to be tilled, the soil should be deepened by deep plowing and heavy manuring. The two should go together. It would be folly to plow up cold soil without warming it with manure. If the land is stony, it should be cleared of stones to a depth of at least eight or ten inches; sixteen would be better. This too is expensive of labor, but it is cheaper than to plow among rocks; and there are thousands of acres in some portions of our country, having a strong soil, but so full of stones as to preclude the possibility of tilling, now regarded as worth but a trifle, but which, high as labor is, could be cleared to the depth of a foot, for about half the price per acre of the best lands in the same neighborhoods, and yet would be as good as the very best when this was done. And there are other thousands of water-soaked lands, from which the water could be taken at an expense less than the increased value of the land.

Clay lands may be amended by the addition of sand; sandy lands, by the addition of clay; and peat may serve as an amendment to both clayey and sandy lands. Before being at the expense, however, of removing large quantities of clay, we should inquire into its character; for if it contains a considerable portion of marly or calcarious matter, so as to act both as a fertilizer and an amender of the soil physically, rendering it more compact, it will be likely to pay well for the labor; whereas, if it is nearly a pure clay (silicate of alumina), with no alkalies, no phosphates, nothing that can supply food to plants, it is doubtful whether it will compensate the labor of transportation more than short distances, and that under the most favorable circumstances, as when it can be loaded easily, and carried down instead of up hill, or at least on a level. Careful experiment on a small scale, will always decide the question, whether you can afford to do it on a large one. So it is with regard to the removal of sand on to any clayey soil. Try the effect before doing too much on uncertainty. It is so also with regard to peat or swamp muck. No two swamps are alike. The peat, or muck, should be tried. Some swamps yield a substance which may

be carried directly to the field. That from others, would injure the first crop, if applied before it had been exposed a long time to the sun, air, and rain. The product of other swamps seems to be of little value any way. Hence, we suppose, the endless disputes about the value of muck, one thinking it of great worth, another regarding it worth nothing, and both being about right, it may be, as regards the particular muck which each has in his mind. Any muck, however, must be of considerable value to put in the barn in a dry state for an absorbent of the liquids of the yard and stable. If you double the amount of the stable manure by adding dry muck enough to absorb all the urine, you double the value. So we should think, from reasoning on the subject; and so the very best farmers tell us; while we know of no one, who has tried it thoroughly, who thinks otherwise.

We should like to speak of the capabilities of soils, but we fear we have already wearied our readers. We will, however, just say here, what we may attempt to illustrate at another time, that as population increases, we believe the productiveness of soils will increase; that the very worst soils, under the hand of industry and intelligence, will become good; and that there is hardly a limit to the capabilities of soils. The population of the earth is now about equal to one person to thirty-two acres of land. If men should leave off killing each other in war, and would behave passably well otherwise, the population of the globe would double once in twenty-five years; in which case there would be thirty-two persons to one acre within less generations than from the Pilgrim Fathers to us; and yet we have no fear that our descendants will starve. It seems to us, that this globe is yet in the very dawn of its present geological period; that teeming millions—thousands to one for all that have been—are yet to dwell upon it; that mother earth, under the Providence of an All-wise Ruler, can and will feed and clothe them all, and give them habitations.

ROTATION OF CROPS.

It is always better to prevent special exhaustion of land than to cure it. It is often difficult to discover what the land really requires, and, therefore, to cure the evil when it exists. The only method of preventing it with which we are yet acquainted, is by the introduction of a skillful rotation or alternation of unlike crops. In adopting such a rotation, we only copy from nature. In the wide forest, many generations of broad-leaved trees live and die, and succeed each other; but the time comes at last when a general pestilence seems to assail them; their tops droop and wither, their branches fall off, their trunks rot. They die out, and a narrow-leaved race succeeds them. This race again has its life, of centuries, perhaps: but death seizes it too, and the expanded leaf of the beech, the ash, and the oak,

again cheer the eye—playing with the passing zephyrs, and glittering in the sun. So in the broad meadow, the old pasture changes, and new races of humble grasses succeed each other as the fields increase in age. The alternation of crops, therefore, asserts to itself something of the dignity of a natural law, and man is evidently in the right course when he imitates nature in a procedure like this. But upon what do its good effects depend? Why do the broad leaves alternate with the narrow in the ancient forest? Why do the grasses change in the old meadow? Why does the farmer obtain a larger produce, and for a greater number of years, by growing unlike crops alternately, than by continuing year after year to grow the same? The reason is not merely that one crop carries off more, and another less, of all those which all our crops derive from the soil, but that one crop carries off more of one thing, another crop more of another. The grain carries off phosphorus, the straw silica, the bulb alkaline matter.

After, perhaps, fifteen or twenty successive crops of the same kind, the surface soil through which the roots are spread becomes so poor in those substances which the crop especially requires, that the plant cannot obtain from it a sufficient supply to nourish and bring to maturity the full-grown plant, within the time allotted to it in our climate for its natural growth. The roots do their best; they collect as diligently as they can, but winter comes on, and the growth ends before the plant is fully matured. In the case of corn, the first effect of a scarcity, say of phosphoric acid, is to make the ear smaller and the number of grains less; the next to continue the growth into the winter, and only when a very fine season occurs to ripen the ear at all. But suppose we alternate the corn crop, which in its grain carries off phosphoric acid, with a hay crop, which requires much silica, or a root crop to which much alkaline matter is necessary—then the one crop would live upon and remove what the other had left in greater abundance. Instead of robbing the soil every year of the same substance, we should be exhausting it more equally of all, and we should be able, for double the time at least, to crop it without the risk of its ceasing entirely to give us a profitable return. We should gradually work up every available substance in the soil, whether such as are naturally present in it, or such as we have ourselves added in the form of manure. What is true of the simple alternations of corn with a green crop, is more true still of a longer and more complicated rotation. The greater the variety of crops we grow, the more perfectly do we avail ourselves of the benefits which an obedience to the suggestions of this principle is fitted to confer upon us. No rotation, it is true, however skillful, will alone prevent the land from becoming ultimately exhausted. Nothing but regular and generous manuring will do this, unless there be, in springs from beneath, or in the decaying fragments of rock mixed with the soil, or in substances brought down from higher grounds, or in the nature of the rains that fall upon the land, some perennial source of those substances which the crops always carry off from the soil. But in a skillful rotation there is this virtue, that land which is subjected to it cannot be ruined in so short a time.—*Farm. Jour.*

SWAMP MUCK AND WOOD ASHES.—INDIAN CORN.

We have said otherwhere that swamp muck, which has been dug six months or a year, and washed and sunned—it should be in low, broad piles, that the sun and rains may affect the whole, and is better in the barn-yard, to be mingled with the droppings of cattle, than anywhere else, provided that do not require too much carting—is almost precisely the same as well-rotted barn manure, with the exception of a few active salts which the manure contains more largely than the muck. We here add, that wood ashes supply the very ingredients in which the muck is deficient as compared with manure. If added to the former, they make it the same as the latter *in composition*, as is shown by analysis, and about the same *in effect*, as is shown by the experience of thousands of practical agriculturists.

Now then, as manure is the universal want, and as accumulations of black swamp muck exist almost everywhere, why are they not more used? If a load of muck, that has lain from August to May, in a sunny exposure, so thinly spread as to have been thoroughly washed of its acids and warmed, is as good as a load of well-rotted barn-yard manure, minus a bushel or two of ashes, or a like value in other ingredients, why do not farmers avail themselves of it more? Is it because they have carefully compared the labor of preparing it with its effects, and find that it does not pay? We think not. Theory would say, it will pay, and give a handsome profit on the labor. Practice, so far as we know, confirms the decision. That some have applied swamp muck, cold from its bed, reeking with acids, and injured their crops, is not to be taken into consideration. The fault was in the manner of application. Its good effects, when properly applied, settle the question. It is not as good as guano, not as good as phosphate of lime, not as good as stable manure, nor as good as those rich green sand marls, on the Jersey shore; but *it is worth something more than the cost of getting it out*, if not too remote, or in places difficult of approach. So much is settled.

Farmers know the worth of a load of well-rotted manure. They generally value it somewhat beyond its real worth as compared with green manure. But it is good; and it ought to be, for it takes two or three loads of green manure to make it; and we do not recommend letting the manure lie over a season to become thoroughly rotted, but rather to incorporate it with the soil, that the return may be had the first season. But for the purpose of comparison we speak of well-rotted manure; and we believe that a load of well-cured muck, with two bushels of ashes, is worth just about as much for any and all the purposes of ordinary farming; and if so, then those farmers who have abundance of it, but seldom use it, do not husband their home

resources of fertility as well as would be for their interest. But our object is, to suggest the most effectual and economical ways of applying it.

There can be no reasonable doubt, that swamp muck improves by exposure to sun and rain for a number of years. This might be conjectured from its absorbent nature, by which it might be expected to take in and condense within its pores various aërial gases, as well as retain ammonia coming to it in rain-water. It is fully proved by accidental experiments, where piles of it thrown up from ditches, have been removed to uplands, after lying fifteen or twenty years, and found to be remarkably efficacious. We do not, however, recommend the digging of it long years beforehand, both because we think nobody would follow our advice, and because we are not certain that it would be well, as the improvement might not equal the interest on the value of the labor. We will only say, that should any one dig out more of it in a season, than he should care to use the next spring, he need not be very sorry, for it will be growing better till he wants it. If the swamp muck is near the farm buildings, there is no better way than to spread it in the barn-yard, at odd spells, during the summer and autumn; and it is well to put a considerable quantity, in a dry state, under cover, to be thrown about the stalls and yard through the winter, as an absorbent. It thus retains portions of the manure which would otherwise escape; and instead of being offensive, as some might suppose, it has a reverse effect—rather absorbs and retains foul odors, thus purifying the air and making it healthier for the animals. It receives from the excrements of the stall or yard, nearly the same active salts which would be communicated to it by a mixture of wood ashes; nor does it rob the excrements of these in an equal degree, for much of what it receives from them is just what would otherwise escape, either in a liquid or a gaseous form—is not so much taken from the manure, but so much saved. This accounts for the testimony of many excellent agriculturists who have often and after long experience, declared to us, that if their manure consists in one half of muck mixed within the yard and stalls, the quality is not thereby reduced, although the quantity is doubled. This is a remarkable instance of harmony between the explanations of science and the testimony of stable, observing men. We remember a farmer, who told us that his manure heaps were equally good, if not better, load for load, when doubled in quantity by the addition of muck. He was famous for raising great crops, and ought to know; but we did not believe him at the time, though we do now; and we asked him if his rum would not be reduced by the addition of half water? His reply was, that he did not deal in rum, but that he *knew* the manure was full as valuable, per load, so treated. We now believe him fully; and

we believe that the fer ility of land can be increased by such means, more economically than by the purchase of any portable manures in the market.

When the muck cannot conveniently be carried to the barn, take it to a level or gently sloping plot of ground, any time from July to October, for the next spring's use, or later if to be kept till one year from that time. So much as is to be composted the next spring, should be spread out not more than a foot in thickness; and the pile may better be two or three times as long as wide, for the sake of turning it with a plough instead of spading it over. If occasionally stirred with the plough, the whole will be more perfectly exposed to the sun, air, and rains. Late in the fall, let it be thrown into a more compact form, say seven or eight feet wide at the bottom, three or four high, and as long as the quantity will make it, and let one bushel of slacked stone lime, or one and a half of shell lime to each load, be mixed with it, the influence of which will be to keep it warm, at least to prevent its freezing much through the winter, and to secure its being in a fit state for composting early in the spring. Any time in April, or early in May, (a few days before it is to be used,) let it be composted with barn manure and wood ashes. We will not say how much of each. The more is used, the better will be the compost, of course. But we have no doubt, and our opinion is the result of many experiments carefully conducted under our observation, that one load of manure and two bushels of ashes to each load of muck, will make a compost as valuable as the best stable manure, and we suspect more valuable, by nearly the cost of the lime and ashes. As any one will see, it should not be applied to peaty land. On any other, and for any crop, it is a good manure, and cannot fail to give good results. On the corn crop, we have seen it applied with very great success, giving, when applied at the rate of nine cords to the acre, yields of from sixty to ninety bushels, (shelled corn,) on land not the best, but which might be considered fair corn land.

Some have added a sprinkling of plaster and a peck of salt to each load of the muck. The latter cannot be of very much consequence; and as plaster does not suit all soils, we suppose it should not be recommended indiscriminately. The value evidently consists mainly in the barn manure, the muck, and the lime and potash, to bring the latter into an active state. If we were preparing this compost for corn, on land known to be favorably affected by plaster, we would add a little of it, not more than 100 lbs. to compost enough for one acre. It might be of some service to prevent the escape of ammonia by fermentation, though we believe the muck would be sufficient for that purpose—that while the lime that was put in the fall before, would tend to dissipate the ammonia of the barn manure, the muck would prevail and

hold it fast. But as it is well to guard strongly against the loss of ammonia, and as plaster is believed by most, though not all, to be a retainer of ammonia in manure, (we believe it to be strongly so, as long, at least, as the manure is moist)—from these considerations, we would add as much plaster as we have mentioned above, unless our land had obstinately refused to be benefited by it. In other words, if we were convinced that plaster had shown itself of no use to our soil, then we would not add it. So with regard to salt: if we believed, as many do, and we rather think rightly, that it is a good fertilizer, always paying the purchase-money, and especially if we thought, as some do, and here again we think rightly, that it is in some measure a protection against worms, then we would add salt, say five or six bushels to compost enough for an acre, but otherwise we would not. The plaster and salt are no essential part of the compost. They are to be used or not at discretion. The question with each farmer is, do they pay, on *his* soil? If they do, douse them in. If not, leave them at the plaster-mill and the shipper's loft.

We have been thus particular, and have run the risk of obscurity and apparent contradictions, to avoid any thing like a prescriptive, authoritative, or grain-and-scruple mode of writing on agriculture. When any one sets up, especially if it happens to be some young sprig of the quill, who never held a plough, or ordered a farm or a plantation, to prescribe the hour and day and mode of every agricultural operation, by a sort of quasi authority, as if the husbandman had no judgment of his own, or no right to exercise it, we can only say, it is not to our taste. We wish to be as far from such an attitude as San Francisco is from Jerusalem. The farmer is unwise, if he does not listen to us, agricultural writers, because we can often aid him to form a correct opinion; but he is a fool, if he does not exercise his own judgment in spite of us. The object of the agricultural press *should be*, not to make the farmer a *book-farmer*—there is a sense in which we want no book-farmers; there is another, in which all ought to be book-farmers—not to make him dependent on somebody in Philadelphia or New-York for a knowledge of what he is to do this hour or next, to-day and to-morrow, month in and month after, but to enable him to be the most independent man living. With these explanations, we give below a sort of recipe for seventy-five bushels of Indian corn an acre, more or less according to the season, on fine corn land, say a medium loam, neither very sandy nor very clayey, and in good but not extravagantly high condition from past culture; and we wish that many of our readers would try it next year, varying the proportions, as in their judgment, better undoubtedly on their own land than ours, may be desirable. We give it for a single acre,

as thus it can easily be applied to a field of any number of acres.

Here it is:

Fourteen loads (say forty bushels each) of fine black muck, up as much as three months beforehand, sunned, washed, and aired, to fourteen bushels of slacked stone lime, or twenty-one bushels of shell lime, mixed in December, and thrown into a high, compact pile over winter.

Fourteen loads (one-third cord or thirty-four bushels each) of stable manure, twenty-eight bushels wood ashes, five bushels salt, one hundred pounds plaster, to be added about the first of May, North—sooner, of course, South; the whole to be intimately mixed.

The ground to be carefully prepared, the compost to come into an active fermentation, and the best time for planting to come about, as nearly simultaneously as can be secured by timing things with judgment.

The compost to be applied in its heated state, and buried under the soil as fast as removed to the field; either the whole to be plowed in by a shallow furrow, (but more or less shallow, according as the soil is a heavy or light one,) or twenty loads thus plowed in and eight left for the hills.

If the latter course is chosen, that is, if eight loads are put into the hills, put the seed on instantly and cover while the manure is yet hot, to secure a rapid germination, so that the sprouts may appear in five or six days after planting.

If the former course is chosen, (that of plowing in the whole,) some other preparation should be applied in the hill, as a small handful of ashes, a sprinkling of poudret, or something else that tends to give the seed an early start, especially if the season is backward and the ground cold.

The application of about one third of the compost to the hill in a fermenting state, would be the safest and the best, were it not for the extra labor, about which every one must judge for himself.

It would be well, after plowing in the compost, or a part of it, to harrow pretty thoroughly, in order to incorporate it more evenly with the soil.

EXPERIENCE IN CORN-GROWING.

A DELAWARE corn planter, who has not failed in twenty years to make a good crop of corn, gives the following as his method of management. He plants always on a sod two or three years old. This is turned down as deeply as three strong horses can turn it, rolled and harrowed well. The ground is laid off for planting *as deeply as possible* without turning up the sod. The corn, lying at the bottom of this furrow, is covered with two or three inches of earth. Its

first roots strike deeply into the ground, where the rotting sod keeps up a continual moisture. The corn being set deep in the ground, the furrow is filled up by the working, the plant is well sustained against storms, and there is no occasion for "hilling up." He works the surface thoroughly and quickly, and finishes by the time it is as high as his hips.—*American Farmer.*

Nothing is said of manure, in this account. We know not how it is with this Delaware planter's land; but our own experience is, that sod of two or three years, though containing in itself the main requisites for a corn crop, requires warming into action by some sort of manure, in order to give a large crop. It has seemed to us also, that seed planted thus deeply in the bottom of the furrow (we like the mode, if the necessary conditions are complied with) would sprout much sooner and be forwarder all summer by the application of a little warming manure in the hill, and that the crop would not only be earlier and safer from fall frost, but much larger for it. But we presume the gentleman referred to takes care of this matter in a way best suited to his land. On such soils as we have been more accustomed to, and in a colder climate than his, we have found it all-important that the crop be thrown forward by a suitable application, as otherwise the plants do not become sufficiently vigorous and healthy to appropriate to themselves the food contained in the sod; and the result is a crop of twenty or thirty bushels to the acre, whereas, if such a dressing of compost as we have recommended otherwhere, had been applied, the same land would have given seventy or eighty bushels, with a handsome margin for profit on the manure, besides leaving the ground in excellent order for an after crop.

There is great importance in the last assertion of the *Farmer*, viz.: "He works the surface thoroughly and quickly, and finishes by the time it is as high as his hips." That is the way, beyond all doubt; and not be breaking down the tall stalks and bleeding the roots in August, just when it is setting and beginning to fill its ears. No stories about weeds or any thing else will ever reconcile us to the late working of surface among corn. N.

GOOD AND BAD INVESTMENTS FOR FARMERS

Some, perhaps we might say many farmers, when they find themselves in possession of a little capital, neglect to avail themselves of the *safe* and profitable mode of investing which is ready always on their own premises, and which is subject entirely to their own control, and too often seek an investment for their spare funds in the stock of some railroad, banking, or other company. This is turning aside farmers' profits from their *natural* channel, and the consequences are the loss of the profits which judicious improvements in fields or implements, or stock or buildings, would certainly have

yielded them, and sometimes the loss of principal as well as interest, by an injudicious investment in stocks.

We have upon a late occasion, as well as upon many former ones, submitted to our readers some suggestions in reference to this subject, intended to persuade them that their safest and most profitable mode of investment lies within the compass of their own legitimate pursuits. Our columns, also, are at all times abundant in hints as to methods in which capital may at any time be invested to good advantage, as in draining, manure-saving, composting, digging and drawing muck, and other modes of increasing the fertility of the soil; in purchasing improved and really useful and labor-saving implements; or, to name no more, in improving the quality of the stock of all kinds, and enlarging and making more convenient the buildings of all kinds upon the farm. In these and many similar ways may a farmer, at almost any time, make a better investment at home, and in his own business, than he can do by the purchase of almost any kind of stocks, or even of bonds and mortgages.

To add confirmation and force to what we have already said on this subject, we give the following remarks from *The Ohio Farmer:*

"How many a farmer has lost the avails of ten years' prosperity by buying railroad stocks! Let him do so no more. The farmer cannot trade in stocks with success. This is a species of venture for which his training disqualifies him. Let him throw no more hard-earned gold into this greedy vortex. He will pronounce our advice good if he will notice facts."—*Country Gent.*

PLASTER FOR PASTURES.

THAT *plaster is not a fertilizer*, that *it does not enrich the soil* directly and by virtue of its own ingredients, is true. Hence it must not be relied upon alone, but should be used in conjunction with other manures, either as existing in the soil in some form of organic matter, or as applied by the farmer in connection with the plaster, or in the form of green crops turned under, or as furnished, in the case of pasture lands, by the droppings of cattle.

It is true also, we believe, that "plaster increases the green portions of plants—stalks, leaves, etc.—more than it does the grain." This is an argument for its use on pastures. Here the increase of the plant, not of the seed, is the thing sought. The plaster, acting on the organic matter in the soil, produces three effects: 1st, the direct increase of feed; 2d, the consequent increase of manure left by the cattle; and 3d, an increased retentiveness of the soil for manure; so that, although plaster is not in itself, strictly speaking, a manure—does not, like barn manure, afford all the elements of food required by plants, nor more than a small part of them, as sulphuric acid and lime—yet its action is to render the soil *permanently* more productive, on all those lands where it is found to operate well; and

those, we believe, are more extensive than is generally supposed, embracing a very large portion of all uplands.

It may be said, that if plaster causes a luxuriant growth of plants, and yet does not furnish the food out of which they grow but in small part, as we have admitted, it must necessarily exhaust the soil. This does not follow of course; because, in the case of pastures, what is taken from the soil is immediately returned to it; and besides, it should be remembered, that more than ninety per cent. of the grass growing in a pasture, comes not from the soil, but from the air. If, then, the sprinkling the surface of a pasture with plaster enables it to retain more of the manure dropped by animals, and to draw more nutritious gases from the air, it is so much saved on the one hand, and so much gained on the other.

We would earnestly commend more experiments with plaster on pasture lands. Do not be deterred by the statements that plaster was tried on lands thirty years ago and did no good. All that may be true, and yet be no guide for the present owner of those lands. The lands were then comparatively new. They may have produced well without plaster, possibly as well without as with in the state in which they then were, and yet in their present state plaster may be of great service.

As to the quantity. For present effect, 100 lbs. to the acre is as good as 400. If, after thorough trial, it is found to be of little or no use, then the extra application will be saved; but if its effect is demonstrated to be good, then, after that, apply 100 lbs. to the acre yearly, or 400 lbs. once in four years, as you find to be most economical. N.

THE UTILITY OF DRAINING.

I HAVE had a peach orchard for some thirty years on high land. I generally planted it with potatoes. In the dry seasons they were always very small, and the ground so hard it was next to an impossibility to get a spade or dung-fork into the ground to get out the potatoes. In a wet season they were large enough, but the greater part of them rotted, and sometimes the whole. The trees in the lower end of the field were unthrifty, and died out in a few years.

You know I think draining the radical cure for all the ills that land or its products are heir to; and a few years ago I went at draining it by laying out a drain across the lower end to empty into a drain in the field adjoining, and then parallel drains up to the higher end of the lot, twenty feet apart, and put a man to digging the same in a dry season. After he had been at work a few hours, I went to see how he was getting along. When asked how he got on, he said, "Shure, sur, this land don't want draining—'tis too dry entirely, and so hard that water could never get into it at all." I told him when he got that drain the whole length, and about three feet deep, I ex-

pected signs of water. About four hours afterward I asked if he got any water. He said no, but it sweats in the bottom. Next morning there was a run of water; and so it was in all the drains.

Now for the result. First, I have never had a rotten potato in it since. In a wet season they come out clean. Before draining, in a wet season, they were so coated with clay, one scarcely knew whether they were potatoes or stones. We have seldom had a greater drought than this season, yet my potatoes are very large, and you can pull a stalk, and then put in your hand and bring out the fine, white potatoes, without using spade or fork. I am sure the excess of produce the first year, paid all the cost of dramage; and the improvement in the peaches is equally marked. I feel confident that every man that could see the improvement would go and do likewise.—*Litchfield Enquirer.*

UNDERDRAINING WITH STONE.

I HAD twenty acres of land which was so very wet that it could be used only for pasture land. I was told by the person I bought it of, that it had been in this wet state for thirty years to his knowledge, and it could never be drained. I bought it with the intention of draining it. In the summer of 1833, I ditched it with over 1000 rods of ditch; this ditch was only two and a half feet deep, eighteen inches on the bottom, slanting down. This ditch I filled with small stone to the depth of fifteen inches, then covered the stone with a light covering of pine shavings so as to prevent the earth from running down between the stones and thereby filling up the drain with dirt, which is the cause of all the trouble in draining in this way. Then I filled the ditch with fifteen inches of earth, leaving twelve inches for the plough, and three inches covering on the stone and shavings, which will never be disturbed, and the ditch will remain in good order always. This completely drained the lot, so that in the fall of 1834 it was plowed, and in the spring of 1835 it was plowed again and sowed to oats, and it produced forty bushels to the acre, and has been in cultivation ever since. The water runs out as freely now as it did the day it was finished, twenty-three years ago; from all appearance it will stand good one hundred years longer.

This manner of draining I learned by reading the *Genesee Farmer*, published by Luther Tucker, in Rochester, in 1831.

J. B. D., *in Country Gentleman.*

The above mode of draining may be highly recommended in specific cases; where there are plenty of pebble stones (it takes an immense quantity) on the same or adjoining fields, and where the surface soil is of such a character that the water of sudden, copious rains will lixiviate through slowly, instead of forcing a passage and rushing into the drains in torrents, carrying in soil and filling up the openings among the stones, so as to render the drains ineffective. We have no doubt that these conditions existed in the case of J. B. D. If he had plenty of stones near by, that needed to be removed, that was an

economical way of getting rid of them; whereas, if he had them to bring any considerable distance, his drains must have been far more expensive than tile drains. And if the soil of his field was uniform and fine, calculated to promote a slow percolation of showers, instead of a sudden bursting through, that accounts for his drains having stood so long, and still promising well. We again commend his mode. It is good where the requisite conditions meet. But let no one adopt that or any other mode at random. Draining is too costly a business to be undertaken without being pretty reliably assured that you have got the best mode, not for some other man's field, but for your own. It is impossible to give general directions that will not be liable to mislead, unless you are yourself an artist in draining, or take the personal advice of some one who is. Three men in different parts of the country may copy J. B. D.'s drains precisely; and yet it may turn out that the first has made an excellent job, the very best that could have been done in view of all the circumstances; that the second could have effected the object cheaper and better in another way; and that the third has lost all his labor. N.

PRESERVATION OF MANURES.

THE plain truth is, that exact practice has clearly settled the following facts, viz.: That manures should never be exposed to the sun and air, as in an open barn-yard.

That they should be kept under cover, and the heap so arranged with a cistern at its lowest end, supplied with a pump, that the fluid drainage may be pumped back on the heap twice each week, or oftener if required, to prevent *fire-fanging*. That the fluid manures should be led from the stables through inclosed gutters to the drainage cistern, and when the heap is so dry as not to supply the necessary amount of drainage to keep it thoroughly wetted, that water should be added to make up this deficiency.

"That when manure is giving off its odor the owner has a hole in his pocket."

That manures are most retentive of ammonia when thoroughly moist throughout, and if any escape of ammonia is then perceptible, that a small quantity of sulphuric acid added to the drainage of the heap and then pumped back, so as to diffuse itself through the mass, will effectually prevent such loss.

That manures should never be carted to the field until the farmer is ready to spread and plow them under.

That heaps of manure exposed to the sun and air in the field, are continually losing ammonia, and during high winds this is carried away, despite the power of colder portions to retain it.

That during winter rains, when the ground is frozen, the washing of the manure cannot be received by the soil, and thus the volatile portions are carried off by the agency of the sun and air.

That the fluid manure of three animals is worth as much as the solid

manure of four. That the value of barn-yard manures are materially increased by being composted with charcoal dust, swamp muck, pond and river bottom, head-lands, etc., before their fermentation.— *Working Farmer.*

We should have put the estimate of liquid, as compared with solid excrements, a little lower than Prof. Mapes has in the above, though we are quite sure he is not far, if at all out of the way; and we have supposed, that the placing of dried swamp mud in the stalls, enough to absorb the liquids, then throwing the whole under cover, and occasionally adding more mud, and throwing on water, if necessary, to keep the pile quite moist, and yet not enough to drain, would, in general farm practice, be more convenient and equally as preservative of all the fertilizing properties in manure, as the cistern and pump plan commended by him. Of this, however, we are not as confident as Solomon's man who "rages," etc.; and we have introduced the above for the purpose of assuring our agricultural readers, that with the two exceptions, it is all true and important to them. There is, on a moderate-sized farm, a hundred dollars difference in the year's crops, whether you manage the manure as above recommended, or let it go to waste as too many do; and that difference is one which, like compound interest, goes on increasing from year to year. If the farmer who manages the home fertilizers rightly, gets better crops by a hundred dollars this year, he will get them better, by more than a hundred next, and by still more the third. The effect of fertilizers, rightly managed, is to reproduce themselves in continually increasing quantities, and to increase the crops in the same ratio. N.

EXHAUSTING THE SOIL.

We read in America much of the "exhausted soil of Europe." I have seen none of it. So far from being exhausted, I think the soil of Europe is now better than ever. How can soil be exhausted, which has, for centuries, received plentifully of manures, and manures made upon the best possible systems? I think a little reflection, coupled with the proper observance of European agriculture, must lead to the conviction that the soil of Europe is constantly receiving more back in manure, etc., than is taken away in products. Of all farm products, the atmosphere and rains furnish the larger quantities of its component parts, and whenever a proper system of manuring exists the ground must become constantly enriched.

In Europe, manure is the ever-present idea of the farmer; and by gathering all offals, and making manure in any conceivable way, he does not only by green manuring, such as plowing clover under, but by stable, factory, street and dwelling manure, take good care to return to mother Earth the rental she requires, and to do it without grudging, and with compound interest. Soil is only there exhausted

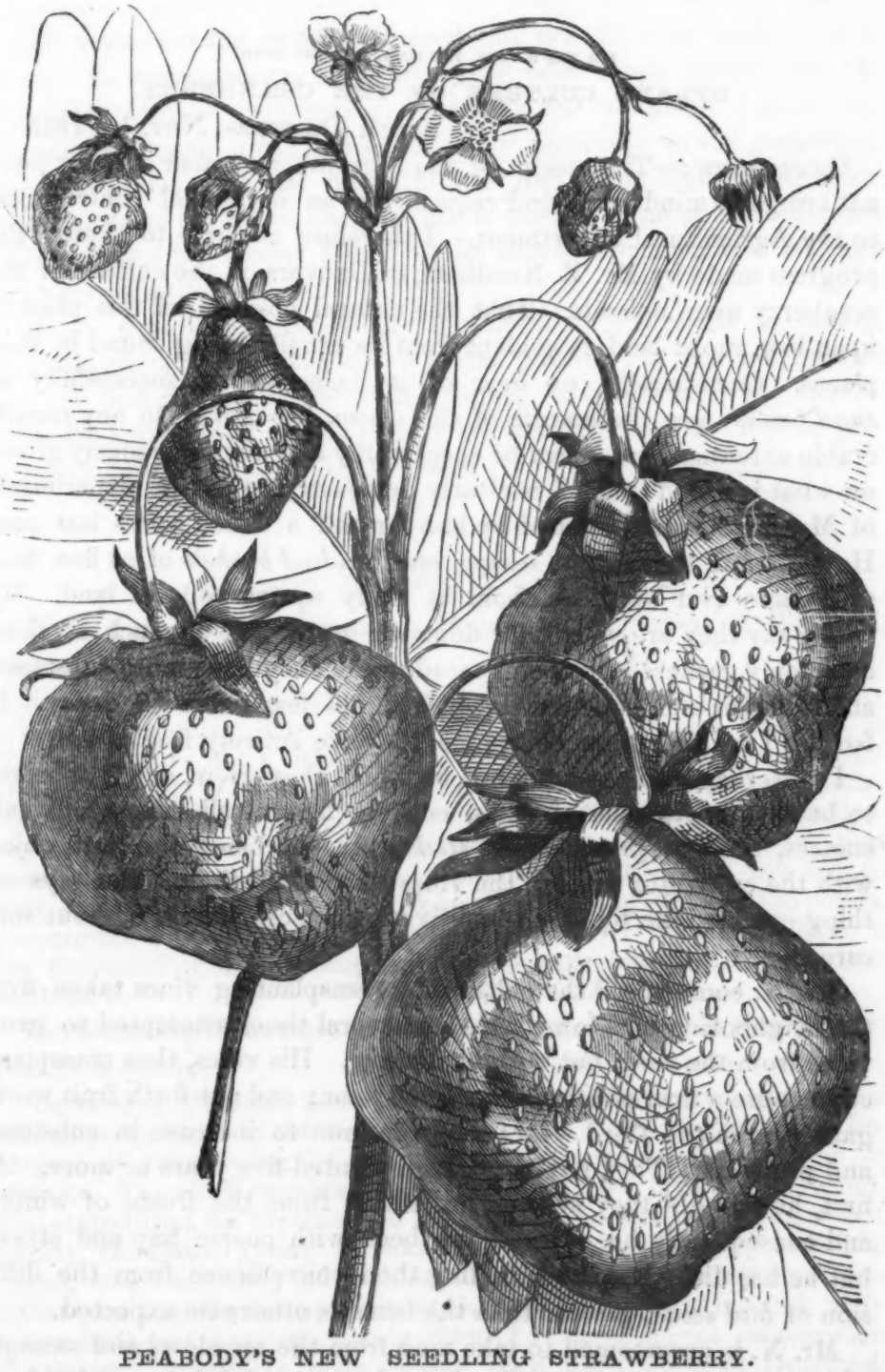
where crops are raised which are entirely removed, and of which nothing is returned to the soil—for instance, tobacco. This is very little the case in Europe. The fine wheat crops, which smile upon the traveler, as he is rushed past them by railroad speed, would be an impossibility, if the idea of exhaustion were true. The meadows, too, which are mown thrice every year, and each time give a good crop, have been mown for ages, contradict this exhaustion theory. No! the European farmer and his land are always on good terms with each other. The man yields good husbandry, and the land yields good crops.

CHARLES REEMELIN. [*Ohio Farmer.*

There is reason to think that the earth, as a whole, is growing bet ter agriculturally; and we have scarcely a doubt, that this progress in the development of agricultural capability will continue so long as it pleases the Supreme Being to uphold the present order of things.

Our reason for taking this cheering view for future generations, we would give, were it not for occupying too much space, with what might seem to some mere speculation. Our moral would be—don't be too anxious to lay up mammoth estates for your children. When you have got *enough*—and enough is less than a million—drive the business still, for that is your happiness; you have got so used to making money, that you can't be happy without making it; but let the surplus "*slide*"—it will do you no good; it will spoil your children. Posterity will take care of themselves; they will have a better world than we are having *physically*—more productive, more easily cultivated. Its agriculture, its commerce, its manufactures, its mining, all its industries are receiving and will receive new facilities. Do, therefore a *present*, not a future good, with the surplus of the money-getting that makes you so happy that you cannot live without it; make somebody else happy with the surplus now—it may be misapplied after you are dead; the same shrewdness that gathered it, ought to have the pleasure of scattering it. Feed the hungry; clothe the naked; educate the ingenious child of want; help the deserving inventor; spread light, science, education, Christianity; fill your own bosom brim-full of blessings. What a happy man you might be, if you only knew how!

WILLIS' IMPROVED STUMP MACHINE—Manufactured at Orange, Mass.—The above machine, which seems to stand without an equal for power and speed in pulling stumps, has a wonderful sale abroad as well as at home. We are told the inventor has just answered an order for sixteen for the Valparaiso market; these, together with others, make some fifty or more shipped for that region within one year. It argues well for those semi-barbarous regions that they are ousting their stumps. PROGRESS.



PEABODY'S NEW SEEDLING STRAWBERRY.

THIS engraving represents, life-size, the seedling grown by Mr. Peabody, at Columbus, Ga., as advertised in our last number. It is no doubt a very splendid berry. Mr. Peabody requires one thousand orders, for a dozen plants, at $5 per dozen, through the whole country, before any plant leaves his grounds. Whenever an order is received, he sends a colored engraving of the plant and fruit, one of which may be seen at this office, and also directions for its culture; and when the number is made up, will notify each subscriber, who may then remit the amount and receive his plants.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

UPLAND CULTURE OF THE CRANBERRY.

SOUTH DANVERS, NOV. 13, 1856.

GENTLEMEN:—The receipt of the November number of your journal brings to mind your kind request for an occasional contribution to the Agricultural department. I therefore contrive to sketch the progress made by Mr. E. Needham, of Danvers, in the culture of the cranberry upon uplands. That the natural position of this plant is upon low, moist land, is evident from its usually being found in such places. Occasionally, we hear of its being grown successfully on *sand banks* near the margin of the ocean, but never to any considerable extent. That it can be successfully and advantageously grown on what is called *upland*, is clearly demonstrated by the experiments of Mr. N., steadily pursued by him for half a dozen years last past. He gathered, the present season, *one hundred bushels* of as fine fruit as I have ever seen, on about as many square rods of land. My family say they are worth, for domestic uses, twice as much as those commonly gathered upon wet meadows. They have more substance, and a higher and superior flavor, and are less liable to decay. In fact, as I see them now before me, they are entirely free of rot.

I yesterday examined the bed on which they grew, and it appeared to be a complete mat of vines, entirely free of all extraneous substances, such as *grass*, *weeds*, *sticks*, etc.—it being the first object with the cultivator to keep the vines clear of all these. He says nothing can be done by way of cultivating the cranberry, without such care.

Mr. N. commenced the culture by transplanting vines taken from the neighboring meadows. He has several times attempted to grow vines from the seed, but without success. His vines, thus transplanted, acquire a firm position the second year; and put forth fruit worth gathering in the third year; and continue to increase in substance and products. They have now been planted five years or more. At first, he thought they needed protection from the frosts of winter, and consequently he covered the beds with coarse hay and straw; but he has discovered this, finding the inconvenience from the diffusion of *bad seeds*, greater than the benefits otherwise expected.

Mr. N. is accustomed to take mud from the meadows and swamps, in the autumn, and when it has been frozen, and become pulverized, to spread it about among the plants, for the double purpose of checking the growth of weeds and grasses, and to absorb and retain moisture. The cranberry delights in having a reservoir of water near, and wants nothing stronger.

Mr. N. says he has applied ashes, plaster, and other like fertilizers

to his vines, but has never witnessed any benefit from such applications. In some seasons, his plants have been much injured by the drought; but the past season, especially the months of August and September, being quite moist, was very favorable to the growth of the cranberry. He has never known the plants injured by a superabundance of water, except when it washed so much as to disturb the roots and the tender fibers of the same, which extend far, and are very sensitive.

Mr. N. says he has repeatedly furnished of his plants to others, and told them how he proceeded in his culture, but has not known any one that has succeeded to any considerable extent. He has repeatedly known fruit sold in the market *as cultivated*, that had no pretence of being such. Truly yours, J. W. Proctor.

SALMON IN THE CONNECTICUT.

We cut the following from the *Homestead*, published at Hartford, Conn.:

Keep it before the people that this noble fish can be propagated by artificial methods. The thing is done in Ireland and England, in rivers that have not a tithe of the prime pasture ground for fish that our river has. This is a matter of great importance to the State, and is worthy of the attention of our enterprising citizens. Companies are formed and capital is invested every year in enterprises that promise not half so well as this. Can nothing be done this fall to start so hopeful an enterprise? Who will talk it up, inclose the ponds, procure the ova, and deposit them in the boxes? Shall we have a few thousand of these young salmon to turn into the Connecticut next fall?

The following facts were presented in a meeting for a similar purpose in Scotland.

Artificial Propagation of Salmon.—A meeting of the salmon fishing proprietors in the river Tay, was lately held at Perth, for the purpose of considering the question of the artificial propagation of salmon. The chief speaker was Mr. Thomas Ashworth, from Ireland, who stated that his brother and he have, at the present time, about twenty thousand young salmon in ponds, produced by artificial means, which are daily fed with suitable food. His brother and himself having purchased the Galway Salmon Fishery in Ireland, they determined to try an experiment there for the artificial propagation of salmon. A suitable place having been fixed upon at Outerard. operations were commenced between the 20th December and the 1st of January last, which was about a month too late, yet boxes were prepared in which the spawn of the salmon were deposited. These boxes were about eighteen inches square and six feet in length, with a zinc grating in the sluice at either end. There were twenty boxes in all, which were filled with gravel or small stones to the depth of six inches. To procure the ova and the milt of the female and male

salmon, the fish were taken by small nets on the spawn fords at night, and instantly and without injury put into a tub one fourth full of water. The female fish was turned on her back, one man holding the tail, another running his hands down each side from the head, and, pressing lightly with his thumbs, the ova was readily discharged into the tub; a similar course readily discharged the milt. About three hundred and seventy salmon were treated in the same manner, and again returned to the river. Mr. Ashworth explained how the ova and milt were mixed in the tub, and then taken out of it with a cup and deposited in the boxes, when it was covered with additional gravel. There were at present about twenty thousand young salmon alive and thriving in these ponds, from two inches to three inches in length. The fine zinc gratings were used to prevent both trout and insects from getting into the ponds, as they were destructive to the salmon fry. The ponds were about twenty yards in length, and twelve to thirteen yards in breadth, and it was intended to keep the young salmon in them for ten months, when they will have grown to about four inches in length. They would then be able to take care of themselves on their way to the sea. He stated also that it was indispensable that the young salmon should be fed daily with chopped flesh-meat. The current of water running through the boxes must be pure and free from mud, and great care was required to be taken during the periods of incubation, when the rivers were flooded by heavy rains, to divert the muddy water from the boxes. It took about one hundred days until the spawn gave indications of life. The expense of this plan of artificial propagation he did not estimate to exceed a pound a thousand, which was at the rate of a farthing each salmon. After some discussion, it was resolved that the experiment should be tried in the Tay; and a committee was appointed to adopt the requisite measures.

AGRICULTURAL LITERATURE.

Self-Government—Mission of Agricultural Societies.

Our *agricultural newspapers* and *magazines* reach numbers and produce effects which are unequaled. Their literary character is alike creditable to their conductors and to the farmers by whom they are read. The great benefits flowing from their extended circulation, are not confined to the improvements in agriculture, which are a sure concomitant of their perusal. They create and inspire a taste for reading, enlarge the sphere of observation, and educate in literature and science a large class who are inaccessible to other influences. They have already taken a high place among the scientific and literary periodicals of the day, and may very favorably challenge a comparison with them. They are worthy of most extended patronage. Their evident effect is to elevate the character of labor.

The problem in self-government which this nation is now working out, is not yet entirely solved. We have, in comparison with other nations of the earth, barely entered upon our existence; and although we were strong at our birth, and our early youth gives evidence of great power and vigor; yet looking with a proper sense of the instruction to be derived from the history of other nations, we can

write no future for ourselves: our course is, to a great extent, untried; we came into existence upon great principles, and we must stand and be built *up* upon such principles, or we must fall; we rely upon the patriotic intelligence of the masses. The laboring classes do, and ever must, form these masses. To give them a clear and intelligent view of their rights, of their privileges and immunities, is to give permanence and stability to our institutions, and to prepare us for a perpetuity of those rights, which shall be a blessing to all "the dwellers on earth."

I shall in this connection be pardoned for saying, that any system of government which disparages the producing classes, must in the end be bad government. It will necessarily contain elements of corruption and dissolution. I need not go further on this point than thus to state the question, for I am sure of a hearty response to the position that for this nation, the true policy of patriotism is to create and multiply intelligent, well-educated laborers.

I have adverted to the influence exerted by the fairs of this and kindred societies, but I have not referred to the greatest and most effectual instrument for elevating labor which is now, or hereafter can be, called into operation.

The cause of agricultural labor is the cause of our common humanity. The onward progress of civilization, of arts, of science, and of all that elevates and adorns society, essentially depends upon its character and the estimate in which it is held. In all the Free States, it sends its contributions of members and influence to every avocation and profession. It claims support. It demands honor. It is to be protected and defended against all assaults, either from an aristocratic pride and feeling at home, or from degrading, servile influences from abroad. Its fruits of industry require the protecting, fostering and expanding care of the government. Its hardy youth demand al those appliances of education which shall amply qualify them for fulfilling their duties as farmers, and carrying out their obligations as American citizens; and our mission—the mission of this and affiliated societies—will not be ended until these objects are accomplished.—*Judge Jessup's Address before the New-York State Society, at Watertown.*

VEGETABLE PHYSIOLOGY.

THE *structure of plants* is exceedingly various. In order to prepare the way for understanding the structure, circulation, and mode of growth in vegetables, we will examine a common tree.

The tree consists of three parts—the *stem*, the *roots*, and the *branches*. Viewing it as *one*, we may regard the roots as the elongation of the stem downwards and laterally; and the branches as the elongation of the stem upwards and laterally. Could we take a full-grown tree—one that has grown in open land, with no obstructions near—we should find it to have much the form of an hour-glass, the stem forming the neck, the top constituting the upper bulb, nearly round, the

roots composing the lower bulb, much wider than the upper, and greatly flattened at the bottom. A tree may be conceived to have grown in so deep and rich a soil, that the roots would be found to have penetrated the ground nearly as far as the branches reach into the air. But such is not generally the case. The roots, loving light soil and warmth, are more inclined to extend off than downwards.

Still, if the subsoil is at all favorable, they descend to considerable depths; and this is one of the reasons why an old soil, with an exhausted surface, but a tolerable subsoil, is improved by the growth of forest upon it—the roots bring up various salts from an unexhausted subsoil, at the same time that the leaves take in carbon from the air; and then both are deposited from falling leaves and decaying branches on the exhausted surface soil. This is God's way of bringing the resources of fertility, in earth and air, together, and placing them within the reach of ordinary cultivation.

If one quarter of the cleared land in the older States, selecting the poorest, now little productive of *anything*, were put to the growing of *timber*, and the rest were better cultivated, it is possible that they would in the long run, produce more food than now, as well as more timber. We should be glad if some one who has studied the influence of forest-growing on the permanent productiveness of a country, would give us his views on this subject. It is an important subject, and one that has not been duly considered among us. If a State would grow an extra million or two of acres of timber once in thirty years, and yet produce as much food and clothing as now, and perhaps more, it is worth knowing; for the cost of growing timber is little more than the interest on the small value we attach to our poorest lands, whereas, a million acres of timber will be worth something thirty years hence, and by that time the land would have become renovated—capable of affording good pasturage.

The stem of a tree consists of four parts—the *pith*, the *wood*, the *bark*, and the *medullary rays*. The functions of the *pith* are little known, and it would seem as if they could not be very important, since if it be entirely destroyed, as in hollow trees, still the tree lives on and sometimes even flourishes. The *wood*, carefully examined, is found to consist of a countless number of hollow tubes running longitudinally. It is of two kinds—the *heart-wood* and the *alburnum*, or white wood. The former is generally somewhat colored; and the tubes of which it consists are closed up so as no longer to transmit the sap. The latter is white; the tubes of which it mainly consists are open, and the sap flows freely through them.

The *bark* also consists of two parts—the *liber*, or inner bark, and the *epidermis*, or rough, outer covering. The *medullary rays* are a sort of division planes running up and down the tree and extending from

the bark to the pith. In splitting wood, these division planes may often be seen, forming a smooth, polished surface, especially in beach and maple, and they are imitated by painters in graining for these kinds of wood. If a tree be cut horizontally, they may be traced as lines running from the pith to the bark, like the spokes of a wheel, from which circumstance they are called *rays*.

Regarding the roots of a tree as its elongation downwards we find them consisting, for some distance, of the same parts as the stem; but if we trace them farther, we find the medullary rays first terminating, and then the pith, so that the root beyond that point consists only of the wood and the bark; and, at the extremity, it does not terminate in a point, but abruptly, the end having much the appearance, when viewed under a high magnifying power, of a collection of fine hair or fur, with an envelope around it, and cut off with a sharp instrument. These blunt ends of the rootlets are supposed to be the mouths, by which all or nearly all the food obtained from the soil, as well as much which is obtained from the air *through the soil*, is received. So exceedingly small are these rootlets, and so numerous are the divisions, that nothing, it is believed, can enter them unless in either a liquid or gaseous state. If so, then the various solids of which wood, bark, and leaves are composed, must have entered the tree either in the form of a limpid solution in water or of an invisible gas.

Looking at the branches as an elongation of the stem upwards, we find them made up, much like the stem itself, of pith, wood, and bark. The *leaf stems*, like the wood, are a collection of tubes placed side by side, through some of which the sap passes upwards into the leaf, while in others it flows back from the leaf to the twig. The leaves consist of a skeleton or frame-work, with a double membrane covering it on the upper and lower sides. Both of these membranes are fitted with countless pores or openings. Those on the lower side of the leaf act as so many mouths to take in food from the air; and those on the upper or smooth side, give off water, in the form of invisible perspiration, and such other matters as the tree no longer requires.

The tubes of which we have said that wood is mainly composed, commencing in the larger roots, pass upward through the stem, through the branches, the twigs, and the leaf-stems, into the upper membrane of the leaves. From the lower membrane of the leaves other tubes commence, running downward through the leaf-stems, through the bark of the twigs, through that of the branches, and through the liber, or inner bark of the stem, to the roots, and probably, though we believe that is not known certainly, to the ground.

Some have supposed that plants, in their returning sap, send back into the soil substances which they had taken in but which are not

required to form their living textures, very much as animals void those portions of their food not required to build up the body. They have supposed that this renders the ground unfit for the same species of plants, but improves it for the production of other species; and they seek thus to account for the fact, that in nature, a growth of no kind of tree is followed perpetually by the same; but that land, left to itself, changes its crop from pine to certain kinds of hard wood, then to others, and so on, taking a somewhat extensive rotation. The fact that nature loves a rotation is evident, and this should be imitated by man; but the above way of accounting for the fact seems not as plausible as another, of which we shall have occasion to speak hereafter. N.

GREEN SAND MARL.

We have had a conversation with Charles Stearns, who in company with others, it appears, is working the Green Sand Marl of Southern New-Jersey into a more portable manure, by first grinding it to an impalpable powder, and then incorporating with it such requisites of vegetable growth as it does not contain in sufficiently large proportions, as compared with others. Thus, he would say, the marl contains the ingredients A, B, and C, and so of all the others required in a first-rate fertilizer, but not in the best relative proportions. A, for instance, is deficient as compared with B and C, so that in order to apply enough of A, you would have to apply an excess of B and C. In other words, he thinks the marl very strong in some points, as potash and the mineral ingredients generally, but not as strong in others. His views, in this respect, are fully authorized by analysis. Now his idea is to bring up the weak points, and make them equal to the strong; and we think it a most sensible idea, perfectly in accordance with the teachings of science; and we have no doubt that he will succeed, to the great benefit of agriculture. But whether he will succeed, as he hopes, in making as good a fertilizer as the best Peruvian guano, ton for ton, is to us doubtful. That he will make one vastly better than guano, in proportion to what it need cost the farmer, we have not a single doubt; because the marl is inexhaustible in quantity, and contains nearly all the requisites of a first-rate manure, while the others, we think, can be added cheaply. We the more readily believe this, because the green sand marl is in itself, in its raw state, an excellent fertilizer. As now sold by the New-Jersey Fertilizer Company, (see advertising sheet,) it costs the consumer less than half the price of guano for an equal value, provided he can get it to his place with little land carriage. We are confident that half the outlay of guano, in this marl, at seven cents a bushel,

will increase the crops as much, and leave the land in better order. This New-Jersey marl is to be a great thing for agriculture; but we would say to both these companies—one represented by George W. Atwater, 16 Cedar street, and the other by Charles Stearns, 132 Water street—put your prices so as to make it a good business for the companies—no one should find a word of fault with that; but put them and keep them such that the farmer may have a fair proportion of the profit. Too many fertilizer companies are built on the expectation of gouging the farmer. It won't do. We are bound by every obligation to protect the farmers. They ought to make at least half the money that is made on manures. Be willing that they should do it, and the business of furnishing them manures will be an honorable, a useful, and still a sufficiently profitable business. N.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SHEEP AND FARMING.

MESSRS. EDITORS:—Some farmers there are who deal very extensively in sheep. They keep a large number, from one hundred and fifty to three hundred, on a farm of one hundred and fifty acres. With such farmers we must dissent, for we believe that there is no animal in the world that bites so closely as the sheep; and hence they are apt to kill grass, or very much impede its growth. But sheep are profitable animals at present prices. We believe a farmer can keep fifty or sixty on a farm of one hundred acres, and do well with them. Now, *first*, you get their growth, if they are young sheep; *second*, you are sure that their wool is also increasing every day in weight; *third*, you know, with kind care and attention, many fine lambs can be raised in the course of a year, and you get the growth of these.

Besides, sheep afford the very best manure for wheat lands. This we have tried, and have found by trial, that wherever they have "laid down" the most, there you would find the best wheat, plump and luxuriant. But in the mean time, we must acknowledge that they are very industrious animals around your pastures, and never will leave them until the last remnant of vegetation is gone. They bear exorbitant prices this fall. You are astonished to have to pay $2 00 to $2 50 apiece for lambs, and from $2 75 to $3 50 for ewes. Wethers demand very large prices, say from $3 00 to $6 00 per head. These figures, be it understood, are applicable to Central and Western New-York, where sheep are now very scarce and high. And men who have brought sheep down from the West this season, have

not made very ample fortunes; a very clear evidence that they are not very cheap in the Western country.

We apprehend, also, that wool, for some time to come, will be high. Hence farmers are encouraged to keep sheep. By the way, cattle are not low, and this fact prevents many farmers from keeping sheep. It is certainly more profitable to winter sheep than cattle, for only see, you get the growth of the wool on the former, while the latter only increase in weight. Then again, should you be successful in raising your lambs, they will bring you at from $2 00 to $2 50 per head when from eight to nine months old.

Now, in connection with farming in general, we believe, and know by experience, that keeping a few sheep on your place, you are a gainer instead of being the loser by the operation. It is not now evident that they will be very low in price for years to come; nor is it clear that cattle will be valueless in the future, for see what a mighty Eastern avenue is open for their annual—ay, their daily escape.

If you are anxious to raise a good piece of wheat, summer-fallow, and in the mean time, let the sheep of your farm have a chance at it too—we mean, at the fallow. They will remove foul weeds, gnaw down the grass in the corners of the fences, manure your lands, and when you harvest your wheat, you will be astonished, with other good culture, to find that you have got a fine, indeed a large crop of wheat. But soil and climate always have "*their say*" about raising wheat, though, nevertheless, sheep will help you on to success, even sometimes it be granted, that circumstances, etc., do not favor you in all respects.

We would like to hear your opinion, Messrs. Editors, on the prospective prices of sheep and cattle; also on wool and keeping sheep, etc. Suppose you give us a little information on these very important subjects. You know the whole country is deeply interested upon these points, and eagerly guzzle down all the information they can get upon matters relating to sheep, cattle, swine, etc.

Meanwhile we want to mention (having noticed your notes on Western travel, and on sowing herdsgrass,) that we are now ratified in this part of the country, that Timothy seed is one more profitable seed. Clover will "heave out" with us, and *Ned* himself cannot prevent it. Last winter we were fortunate, for the snow was deep, and therefore it did not heave very materially.

We sow our herdsgrass-seed in the fall as frequently as at any other time, and prefer that season of the year, because the grass gets a firm hold, and is not apt to give out. We regard clover as of much value as a manure, but give us herdsgrass for hay and profit.

Very respectfully, W. Tappan.

It will depend a little upon the powers that be and are to be, what

shall be the profits of keeping sheep. Should the protection of wools, both *coarse* and fine, remain as it is, we see not why sheep-growing might not be a paying business for some years to come. We believe with our correspondent in keeping a few sheep, if circumstances favor. But no rule will apply to all places nor to all times.

Would not clover and herdsgrass (the clover to predominate the first year, the herdsgrass the second) better answer the double purpose of producing forage and of drawing up minerals from the subsoil? The decision of the farmers in a region is not to be lightly disputed. We only ask.

ON INSECTS--

With Descriptions and Directions useful to the Farmer, Gardener, etc.

We would be glad to know how to write on this great subject so that we shall be read by those whom we design to benefit. There is a repugnance felt by most people to all elementary treatises. And this is not strange. A paper full of technical terms, a succession of strange words, interrupted only by poor attempts at definitions, surely presents very slight attractions for any one. We take as little satisfaction in reading such essays, as in looking at the bare timbers of a frame that may, by and by, become a house. As it is, it is no house. It has neither the beauty, the comfort, nor the value of a house. And even when it is *finished*, if the staging and various scaffoldings employed in its structure still remain the most prominent features of the pile, the view excites no emotions in any body but the architect and owner. So it is in elementary treatises on scientific subjects, both in our journals and in volumes. It is a much more difficult task to enlighten the public as we would, on such topics, in essays that will be read, than to prepare ever so good a manual of the science for the use of those familiar with it. And yet we are bold enough to attempt just such a task in the months to come. We have been over most of the ground, in a certain form, in the year past. We now purpose to attempt a new thing, or the same thing in another shape, more popular, more extensive, and probably, if we do not utterly fail of our object, more useful to the general reader. Our former essays were written, many of them, in unfavorable circumstances. Now, we can allow the ground and the crops, the trees and shrubs, to be cultivated without our care. They have one to attend to them, the correctness of whose opinion on such matters we should no more think of doubting than of withholding our confidence from that of a cashier on the genuineness of a bill of his own bank. By and by, if not now, our readers will agree with us. But this is a digression, though it shows the reader why we can now write with more care than in months past.

We quite agree with our much-respected friend, Breck, in his "Flower Garden," when he asks, "Who can help feeling a little ruffled when some insect has destroyed a favorite plant? and even, like justifying good old Jonah, who 'thought it well to be angry for his gourd,' which a worm had destroyed in the night. What insects were made for, is a matter which has puzzled many a one smarting under their attacks, though, we doubt not, there is an answer that should satisfy us all. But this is not the question for us to settle. Our province is to destroy those which are harmful, and to preserve those which are useful. The impatient housekeeper, with her broom and napkin, making war on everything with wings, except that little fellow poets write about so much, may need more light to enable even her to discriminate as she should; and when she goes into the garden, with a spirit of extermination to all the race, she may, if untaught, do as much harm as good. In fact, we think skill in this department almost as important to the gardener, and other more extensive agriculturists, as the advice of a physician is in respect to those other ills which '*flesh* is heir to.'"

There are various "schools" in medicine, but there is one grand idea which, in one form or another, pervades them all, and that is, that some disease must be produced which shall counteract that already in the system, the new one curing itself. This is what we would do. We would excite a *fever*, but not in the plant. We would excite the student, the physician. It is said that no one ever became a botanist without having a high botanic fever, and we are sure that this is true; and, still further, our own experience and observation both show us that even this may not be enough. The fever must last for several successive years. So it is with a knowledge of insects. The pupil must be, to some extent, an enthusiast, or he will fail to become an adept in the science. He cannot become such as a duty; it can only be with the spirit we have described. We wish this fever was fastened upon many of us, and could become an epidemic. But

WHAT IS AN INSECT?

The true insect is an articulated animal, having six legs, two antennæ, two compound eyes, a small brain at the anterior of a double medullary chord. Their circulation is effected by a pulsating dorsal vessel (answering to the heart of mammalia), provided with numerous valves. Respiration is sustained by tracheæ, or tubes, which form two lateral trunks, and ramify through the body. They are oviparous, of two distinct sexes, and attain an adult state only by passing through a series of metamorphoses. They generally have two pairs of wings.

The name *insect*, seems to have had its origin from the idea that the animals of this class are "cut," or divided, into separate and dis-

tinct parts, as head, thorax, and abdomen. It is derived from the Latin *seco*, to cut.

According to the definition just given, spiders are not insects. So, also, many worms are not included in it. Some worms, commonly so called, are insects in a transition state. The potato worm is an example of this kind. The appearance of such an individual, in a single condition, is not decisive of its proper place in Natural History.

There is one point which is often of no little practical importance, which yet, perhaps, requires some practice to give one confidence in his own judgment. It may often be desirable for the farmer or planter to know the sex of the nuisance which he discovers upon his crops. If he finds what he supposes to be a female insect, and, perhaps, an abundance of eggs on a given plant, he may know that he has discovered an enemy too dangerous to be suffered to exist, and he should use every means in his power to destroy her forthwith. Females of many insects multiply so abundantly that by killing one he prevents a thousand, and killing two puts ten thousand beyond the power of flight. The following points will determine this matter:

1. The size of the insect. The male is always smaller than the female. 2d. The brightness of the color, that of the male being much more brilliant than that of the female, especially in Lepidopterous insects, which include butterflies and moths. 3d. The form and number of the articulations of the antennæ, those of the male being larger and more numerous. 4th. The presence, and the form and size, of the wing, the males being frequently furnished with wings, while the female is not. And 5th. By the presence or absence of a sting. The female bee, for example, has a sting, while the male has none. The males of some insects are also furnished with sharp prominent points, resembling horns, while such organs are not perceptible, or are feebly marked, in the female. P.

TRIALS OF SPEED AT FAIRS.

Last month we published some remarks on this subject, of Senex, (*an old man*, if our Latin does not grow rusty). Below we publish from one, who has a Jr. appended to his name, somewhat younger, no doubt, but old enough, we think, to comprehend the truth and express it strongly but kindly. After speaking in terms of general commendation of the late U. S. Show at Philadelphia, this writer says:

We have one word to say with reference to the "trials of speed," which formed the great attraction of this show; and in the outset we desire it to be distinctly understood that we intend no disrespect to the officers of the Society. We know, and freely say, that they have labored well and efficiently to place the Society on a firm footing, and

to give it a secure establishment in the favor of the people. On the point in question we think that they err, not intentionally, but in judgment. They do injustice to American farmers when they require them to give their endorsement to horse-racing—whether under the name of "trials of speed," or whatever else they may choose to call it. Fast horses are *not* an agricultural necessity, nor even an agricultural product. No practical farmer need be told that the rearing and training of such horses is at utter variance with agricultural success; and no hard-working, intelligent farmer sees his son turning his attention to the development of speed in horses, especially for competition on the track, without trembling for his success as a farmer. Strength, docility, and power of endurance, are qualities which should take precedence over speed; and the encouragement of attention to this latter will never produce one benefit, pecuniary or otherwise, to any young farmer whose fortune is to be that of an earnest, intelligently industrious man. Fast horse-flesh has no practical value since the introduction of railroads and telegraphs. Its only appeal is to feelings which are, to say the least, not conducive to strict attention to business.

We do not go so far as those who say that the Agricultural Societies of this country are gotten up by those who, being professors of religion, cannot with propriety attend the races which are given by the jockeys, and that consequently they invite jockeys to attend *their* "trials of speed;" but that there may be, hereafter, a division between the horse-trotting and the agricultural portions of these exhibitions, is our most earnest desire. If we cannot have Agricultural Fairs without this accompaniment, let us wait until we can. We believe that the trial of implements, which is to come off next year, (we hope,) will prove that American Agriculture is able to walk alone.

On the subject of the banquet and its attendant speeches, we have little to say, though we did wish that some of our farmers' wives and daughters could have superintended its management. Two or three of the speeches were good; but when three political parties are actively engaged in "saving the Union," it appears to us that that subject need not be *dragged out* at an agricultural banquet. If the Union should ever be in any real danger, the farmers will show our political gentlemen a short way to settle the matter; but when we get up a dinner on our own account, and for our own advancement, we would respectfully suggest to them that we do not care to listen to such subjects.

In conclusion, we only ask our friends of the United States Agricultural Society to give us a chance to have an *agricultural* show, pure and simple, and, in our opinion, it will prove at least as useful to the country as the one which has just transpired.

G. E. W., Jr., *in the Working Farmer.*

Horse Power.—The power of a horse is understood to be that which will elevate a weight of 33,000 pounds the height of one foot in a minute of time, equal to about 90 pounds at the rate of four miles an hour.

APPLE POMICE.

We are often asked whether this is of any worth for the land, and if so, how it can be used. The value cannot be great, especially since the new way of making cider without straw. But if composted with lime, it would in no very great length of time crumble down into a black mould, in which state it might be worth something—a little more, perhaps, than the cost of the lime; and what would otherwise be a lasting nuisance would be got rid of. It would be well first to let the pigs root among it, and eat the seeds and other parts, as they would. If composted with lime, it should hardly be permitted to lie where the family would breathe the fumes arising from it. N.

SINK WASHINGS.

These should always be applied to the land. Wherever the ground about the buildings is such that it can be done without offending against neatness and health, they should be directed to a tank, or, what is quite as well, an excavation, for the purpose, to be filled half or two thirds full of some rich vegetable matter in the spring, more of the same to be thrown on from time to time through the season, and the whole to be carried off the next spring and applied to the soil. From ten to twenty loads of as good manure as the farm affords may be thus manufactured at little expense; and it is worth considering, that the carbonaceous character of the peat or mould used renders it a good retainer of the foul gases that would otherwise infest the premises. N.

FARMERS SHOULD WRITE.

We would request a careful consideration and faithful regard for the following remarks of the *Germantown Telegraph* on the subject of furnishing matter for the Agricultural department:

"We thank the cultivators of the soil for their communications; and as the evenings are now becoming long, and the labors of the field abridged, we hope to enlist many others, not now upon our list, as contributors to the Agricultural department. There is scarcely a farmer, however limited his operations, but who can jot something down from time to time, of interest to others in the same line of business; while there are others, experienced, experimenting, and scientific farmers, who always have it in their power to send us articles which would be read with avidity by their brethren. As we have mentioned many times, communications sent to us in the rough, will be carefully corrected before printing, so that no one who has any fact to make known, need be afraid that it will not be fit for the public eye." —*N. Y. Observer.*

So with us. It is a difficult matter to correct an article, which needs

correction, so as to make it clear and concise, and yet not do violence to the writer's thoughts. We can often write two new ones more easily. But we will cheerfully make all needful corrections, if farmers will send us short articles, expressed in their plain, right-to-the-point way, on matters of their every-day experience, and about which they are supposed to know more than any others.

BREADSTUFFS.—EXPORTS, ETC.

From De Bow's Review.

THE returns from the wheat harvest of the United States are now complete, and it is settled that the crop is of most excellent quality, and if not the largest ever gathered since the settlement of the country, is at least above the average, and will yield a large surplus beyond the supply of our domestic wants. With the certainty of such abundance, the probable reliance to be placed upon an active export demand is a subject of much importance, and deserving serious attention. Our imports of foreign goods and merchandise for the eight months of the current year, are larger than for any similar period in our history, the total being upwards of $150,000,000; and although much of this increase has been in consequence of large exports of domestic produce to this date, yet if these exports are to cease with the in-gathering of the present harvest in Europe, it might take a larger portion of the receipts of gold than we could conveniently spare, to balance the account. Great Britain has always been the best customer for our surplus breadstuffs. To most other countries which take breadstuffs of us, our shipments of flour have been comparatively uniform, whether the crop was large or small, but to British ports the shipments have varied with the quantity we have had to spare, although averaging nearly half the total clearances for all foreign ports.

Brazil and the West Indies are regular customers for our flour, as they purchase about the same quantity every year, and after Great Britain, take the largest quantity in a series of years; but a large portion of our shipments of grain (with wheat and corn) go to British ports. Thus of 18,583,151 bushels of wheat shipped to all ports from July 1, 1849, to June 30, 1855, 14,061,212 were sent to Great Britain; and of 43,757,597 bushels of corn exported to all ports within the same period, 36,563,951 bushels had the same destination. We annex a tabular statement showing the exports from all ports of the United States to all foreign ports, of wheat, wheat flour, and Indian corn, both in quantity and value, from 1849 to 1855, inclusive, with a comparison of the quantity of each sent to Great Britain. The totals are all taken from official documents, and may be relied upon as authentic, although it must be noted that of many direct clearances to Great Britain for orders, there are sometimes considerable quantities directed from thence to Continental ports. The "famine" of 1847, led to large shipments of breadstuffs, and to the inauguration of free trade in England, and we commence therefore with 1848–9, when the business had become settled under this system. The periods noted are the fiscal years, ending June 30:

Exports from the United States, of Wheat, Wheat Flour and Indian Corn, from 1849 *to* 1855, *inclusive, for the year ending June* 30.

1849.	To Great Britain. Quantity.	To all For. Ports. Quantity.	Value.
Wheat, bush. - -	1,072,780	1,527,534	$1,756,848
Flour, bbls. - - -	953,815	2,108,013	11,280,582
Corn, bush. - - -	12,396,242	13,257,309	7,966,369
1850.			
Wheat, bush. - -	316,926	608,661	643,745
Flour, bbls. - - -	370,777	1,385,448	7,098,570
Corn, bush. - - -	5,957,206	6,595,092	3,892,193
1851.			
Wheat, bush. - -	592,583	1,026,725	1,025,732
Flour, bbls. - - -	1,004,783	2,292,335	10,524,331
Corn, bush. - - -	2,760,329	3,426,811	1,762,549
1852.			
Wheat, bush. - -	2,049,557	2,694,540	2,555,209
Flour, bbls. - - -	1,532,094	2,799,339	11,869,143
Corn, bush. - - -	1,894,700	2,627,075	1,540,225
1853.			
Wheat, bush. - -	3,574,248	3,890,141	4,354,403
Flour, bbls. - - -	1,388,065	2,920,918	14,783,394
Corn, bush. - - -	1,653,840	2,274,909	1,374,077
1854.			
Wheat, bush. - -	6,058,903	8,036,665	12,420,172
Flour, bbls. - - -	2,026,121	4,022,386	27,701,444
Corn, bush. - - -	5,965,850	7,768,816	6,074,277
1855.			
Wheat, bush. - -	396,215	798,884	1,329,246
Flour, bbls. - - -	189,712	1,204,540	10,896,908
Corn, bush. - - -	5,935,284	7,807,585	6,961,571

The ordinary shipments in the past have not included any thing direct from France. In the first year named above (1849) there were no exports of flour to French ports, and only 108 bushels of wheat; in 1852 the total includes 2700 bbls. of flour, and in 1853 only 8784 bbls.; but in the year ending June 30, 1854, there were shipped direct to France 1,041,086 bushels of wheat, 728,279 bbls. of flour, and 39,400 bushels of Indian corn. In the following fiscal year (1854–5) the shipments of flour to the same ports had dwindled down to 8557 bbls., and there was no shipment of wheat, but the exports of corn increased to 312,740 bushels. During the year 1855 the partial failure of the crops on the Continent of Europe, led to large direct shipments, and the total exports to France for 1855–6, not yet officially compiled, have been larger than ever before recorded to the same ports. As soon as the threshing of wheat commenced in the west and north of France in 1855, its bad quality and light weight created a general panic, and prices continued to advance up to the first of January. The abundance caused by the large receipts from this country, Spain, and other sources of supply, caused a downward tendency in prices throughout January, 1856, and every thing was promising for the next harvest until the inundations in May. These checked the decline without wholly arresting it, but as the harvest

approached, the hopes of an average crop became less sanguine, and it is now generally admitted that the supply will be deficient from five to ten millions hectolitres, that is, from fourteen to twenty-eight millions of bushels.

The quantity of arable land in France, is set down at 56,810,000 acres, of which fourteen millions hectares, or 34,580,000 acres are devoted to the culture of grain. The average annual product is 495,000,000 bushels of wheat, oats, rye, maize, and meslin—of which about one fourth are oats, and two fifths, or 198,000,000 bushels, are wheat. With an average crop, France has heretofore been able, not only to supply her own wants, but to furnish about 5,500,000 bushels of wheat (or its equivalent in flour) for the consumption of Great Britain. It is evident that this export trade must be cut off or greatly reduced during the current year, as the crop in France is below the wants of her own people. Indeed, the total exports to Great Britain from all French ports, for the year 1855, amounted to an equivalent of only 880,000 bushels, or about fifteen per cent. of the usual shipments, and this was all foreign produce, shipped from bond.

In Great Britain, the crop this year is very good, but it is never sufficient to supply the wants of the people. The total imports of breadstuffs into the United Kingdom for the last three years, (reckoning flour, &c., at its equivalent in grain,) are as follows:

Calendar Year.	Equal to bushels wheat.
1853, - - - - - -	84,419,632
1854, - - - - - -	63,267,240
1855, - - - - - -	50,227,608

The high prices have contributed to reduce the imports into the United Kingdom during the last two years to the lowest possible point; but for the first six months of the current year the total imports amounted to 1,859,000 quarters, showing an increase of 161,000 quarters, or 1,248,000 bushels, and must continue at about this rate throughout the remainder of the year. Even with a good harvest, the kingdom must need at least 40,000,000 bushels grain, or its equivalent in flour, for its own consumption. Of this amount Russia, (Northern and Southern ports,) whose supplies were cut off during the war, can now furnish 10,000,000 bushels; Prussia (whose harvest is this year below the average) 10,000,000 bushels; all other countries, 5,000,000; leaving 15,000,000 to come from the United States. If prices rule at a comparatively low rate, the consumption will be increased and the quota from this country may reach twenty or twenty-five millions of bushels. Spain and Portugal have hitherto exported to both France and England, the shipments to the latter, last year, being upwards of 4,000,000 bushels. This year, the harvests are there so poor that the export is prohibited, and supplies for consumption in the Peninsula are going forward from this port.

We see, therefore, that in addition to the demand for the breadstuffs from regular customers, we are likely to have an increased export trade to Europe, making the aggregate probably more than 40,000,000 bushels wheat and corn, or its equivalent in flour.

It is difficult to ascertain the exact production of the United States. The total arable land under actual cultivation is given in the census of 1850 at 113,032,614 acres, of which 51,700,000 acres were pro-

ducing breadstuffs. The following was the total production of grain as given in census returns for 1840 and 1850:

	1840.	1850.
Wheat, bushels, - - - -	84,823,272	100,485,944
Rye, - - - - - -	18,645,567	14,188,813
Oats, - - - - - - -	123,071,341	146,584,179
Corn, - - - - - - -	377,531,875	592,071,104
Barley, - - - - - -	4,161,504	5,167,015
Buckwheat, - - - - -	7,291,743	8,956,912
Total, bushels, - - - -	615,525,302	867,453,967

A very large amount of arable land has been brought under cultivation since 1850, and those most conversant with the West and its increased resources, think that the product of wheat has increased at least, 50 per cent. since the date last given, while other grain has increased 20 to 25 per cent. The total yield of wheat being computed at 150,000,000 bushels, it is easy to see that the export demand can be filled without creating any extraordinary excitement throughout the country. Last year the farmers anticipated such high rates, that many of them refused to sell in time, and thus, to their great chagrin were obliged to dispose of their stock at the close of the season far below the average price. This year early sales promise to be the best, but there appears to be a limit below which foreign orders would rapidly diminish any home accumulation. At present good white wheat is worth here about $1 60, and good red about $1 50. We scarcely expect to see a decline of twenty cents from these rates during the current season, but within that range an active foreign business may be expected. The prospects for Indian corn cannot be given until nearer the close of the harvest. Flour will fluctuate more than wheat in price; sales have been made to arrive in England at a price which would nett here about $5 00 for standard superfine, but this is generally thought to be an inside price. We have compiled from the official records a statement of the average export price of flour in each year since 1800. The highest was $14 75 per barrel, at which all the shipments averaged in the year 1817. The lowest was $4 24, which was the average of 1852. The following is the average of the total shipments to all ports in each year for the last twenty years:

Yearly average price of the Exports of Wheat Flour from the United States to Foreign Ports from 1836 *to* 1855.

Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.
1836..	$7 50	1841..	$5 20	1846..	$5 18	1851..	$4 77
1837..	10 25	1842..	6 00	1847..	5 95	1852..	4 24
1838..	9 50	1843..	4 50	1848..	6 22	1853..	5 60
1839..	6 73	1844..	4 75	1849..	5 35	1854..	7 88
1840..	5 37	1845..	4 50	1850..	5 00	1855..	10 10

The periods above noted are the Government fiscal years, ending June 30. The average for 1856 is not yet made up, but will be considerably below that of 1855. If any think we have over-estimated the present production of wheat in this country, we have only to remind them, that the cultivation of this grain for export received

but little stimulus until the repeal of the English Corn Laws in 1847, and that the export trade has since rapidly grown into importance. This trade has contributed more to the importance of New-York, as a commercial emporium, than is generally acknowledged, and is likely to increase in magnitude for many years to come.

EDITORS PRAIRIE FARMER: There is a great fuss, who is to be the man—Buchanan or Fremont. He should be the man who would endeavor to let us prairie farmers have *wire* to fence our splendid wastes free of duty, from England or Scotland, as we then could have wires so very cheap, either in the web or by the rod. We would then have the size for fencing for about $70 per ton. The freight on an article of this kind is merely nothing comparatively. Australia is fenced with wire from England. Wire web, with large mesh, is what is used there for extensive sheep-walks. Is it not too bad to keep us in bondage for want of fencing material?—worse bondage than gathering straw and stubble, to try to buy boards at an extravagant price, and have it to haul twenty miles, perhaps. Should not order be given to the officers to allow this article to pass, without duty, as it would be so much benefit to the country? Should this meet your approval, please send it the rounds with your own remarks.—*Geo. Wise.*

We do not know what the present tariff is on wire or iron, but know that it is much lower than it should be—at least, this is our opinion. There is no political economist but advocates free trade in its most extended sense, but "one hand must wash the other." It *is* policy to reduce the tariff on some articles much below the general standard, but we very much doubt if (although it might benefit a *class* of individuals) such a course with regard to wire would result in the greatest good to the greatest number. We have great mineral resources, and *necessity*—the necessities of our own people—will alone develop these resources. We do not doubt that a low tariff on *iron* would *increase* revenue. It is not with this view—the salvation of our revenues—that we advocate a high tariff, but for our own benefit as a great commercial people, and as an agricultural class. How as an agricultural class? We want the grain, the products of our soil, consumed at home. To do this, there must be more manufacturing labor here, which will consume the surplus of our farms—*Ed. Prairie Farmer.*

We do not know whether the duties on iron in the particular from of fence-wire are too high or too low; but we do know that, if American agriculturists are to prosper, their fences must be made *in* America and not in England, *out of* American materials, and *by men* who consume American farm produce.

We know another thing; if Mr. Wise would advocate free trade in iron generally, in its various forms, as well as that of fence-wire, as a measure favorable to American agriculturists, or any other Americans in the long run, he is not what his name would seem to import. We

hardly believe he would, and we will not believe so foolish a thing of any man till fully assured of it.

We know another thing yet—perhaps shall find that we know more than we thought we did—that the editor of the *Prairie Farmer* is essentially right in the above. We would not speak of a high tariff. Give us such a tariff as will enable enterprising Americans, willing to work on fair terms, to make that more than a million tons of iron which we now import, or American farmers, and Mr. George Wise among them, will in less than ten years be crying out for a fair price for their wheat, meats, butter, and cheese, *and can't get it.* The husbandman who cannot see that, don't know on which side his bread is buttered.

Education of the Agriculturist.—No man is so high as to be independent of the success of this great interest; no man is so low as not to be affected by its prosperity or decline. Agriculture feeds us; to a great degree it clothes us; without it we could not have manufactures, and we should not have commerce. These all stand together, but they stand together like pillars in a cluster, the largest in the middle—and that largest is Agriculture. We live in a country of small farms and freehold tenements; a country in which men cultivate with their own hands their own fee-simple acres, drawing not only their subsistence, but also their spirit of independence and manly freedom, from the ground they plow. They are at once its owners, its cultivators, and its defenders. The cultivation of the earth is the most important labor of men. Man may be civilized, in some degree, without great progress in manufactures, and with little commerce with his distant neighbors; but without cultivation of the earth, he is, in all countries, a savage. Until he gives up the chase and fixes himself to some place and seeks a living from the earth, he is a roaming barbarian. When tillage begins, other arts follow. The farmers, therefore, are the founders of human civilization.—*Daniel Webster.*

Effects of Drainage.—All the rain that falls upon our fields must be carried away either by natural or artificial drainage, or, having thoroughly saturated the soil on which it falls, be left upon the surface to be carried off by evaporation. Now, every gallon of water thus carried off by evaporation, requires as much heat as would raise five and a half gallons from the freezing to the boiling point! Without going to extreme cases, the great effects of the heat thus lost upon vegetation cannot fail to be striking, and I have frequently found the soil of a field well drained, higher in temperature from 10° to 15° than that of another field which had not been drained, though in every other respect the soils were similar. I have observed the effects of this on the growing crops, and I have seen not only a much inferior crop on the undrained field, but that crop harvested fully three weeks after the other; and owing to this circumstance, and the settling in of unsettled weather, I have seen that crop deteriorated fully ten per cent. in value.—*Journal of Royal Ag. Society.*

THE COTTON CROP OF 1855–'56.

PRODUCTION AND CONSUMPTION TO SEPTEMBER 1.

NEW-ORLEANS.	BALES.	TOTAL.
Exports—		
To Foreign ports	1,572,928	
Coastwise	222,100	
Burned, &c	1,200	
Stock September 1, 1856	6,995	
		1,803,218
Deduct—		
Received from Mobile, Montgomery, &c	73,573	
Received from Florida	5,186	
Received from Texas	28,601	
Stock September 1, 1855	39,425	—141,785
Total, 1856		1,661,433
Total, 1855		1,282,644
ALABAMA.		
Exports—		
To Foreign ports from Mobile	485,(35	
Coastwise, includ'g 37,031 bales from Montgomery to New-Orleans, direct	195,622	
Consumed at Mills	1,936	
Stock September 1, 1856	5,005	
		687,598
Deduct—		
Received from New-Orleans	5	
Stock September 1, 1855	28,519	— 28,524
Total, 1856		659,074
Total, 1855		454,595
TEXAS.		
Exports—		
To Foreign ports	34,002	
Coastwise	83,515	
Stock September 1, 1856	628	—118,140
Deduct—		
Stock September 1, 1855	2,062	— 2,062
Total, 1856		116,078
Total, 1855		80,737
FLORIDA.		
Exports—		
To Foreign ports, Uplands	35,858	
Coastwise, Uplands	95,150	
Sea Islands	10,900	
Stock September 1, 1856	74	—141,982
Deduct—		
Stock September 1, 1855	166	— 166
Total, 1856		141,816
Total, 1855		136,597
GEORGIA.		
Exports—From Savannah		
To Foreign ports, Uplands	177,182	
Sea Islands	8,138	
Coastwise, Uplands	200,426	
Sea Islands	7,346	
Stock at Savannah, September 1, 1856	1,550	
Stock at Augusta, September 1, 1856	1,731	—396,423
Deduct—Receipts from Florida, Upland	886	
Sea Island	2,755	
Stock at Savannah and Augusta, September 1, 1855	3,827	— 6,968
Total, 1856		389,455
Total, 1855		875,358
SOUTH CAROLINA.		
Exports—From Charleston		
To Foreign ports, Uplands	352,846	
Sea Islands	18,765	
Coastwise—Upland	133,451	
Sea Islands	9,286	
Burnt at Charleston 518 S. I., and 233 Uplands	751	
Stock at Charleston, September 1, 1856	3,144	
	517,743	
Exports—From Georgetown to Northern ports	2,893	—520,636
Deduct—Received from Florida, Upland	578	
Sea Island	6,(27	
Received from Savannah, Upland	13,281	
Sea Island	2,689	
Stock at Charleston, September 1, 1855	2,085	— 24,660
Total, 1856		495,976
Total, 1855		498,557
NORTH CAROLINA.		
Exports—		
To Foreign ports	96	
Coastwise	26,072	
Stock on hand Sept. 1, 1856	150	— 26,318
Deduct—		
Stock on hand Sept. 1, 1855	200	— 200
Total, 1856		26,118
Total, 1855		27,805
VIRGINIA.		
Exports—		
To Foreign ports	70	
Coastwise and manufactured, (from the ports)	20,700	
Stock on hand Sept. 1, 1856	842	— 21,612
Deduct—		
Received from Mobile, direct	652	
Stock on hand Sept. 1, 1855	502	— 1,154
Total, 1856		20,458
Received at New-York, Philadelphia and Baltimore, overland		13,834
Total crop of the United States		3,524,242
Total crop of the United States. 1855		2,847,616
Increase on last year.....Bales		676,626
Increase on year before		595,103

CONSUMPTION.

		Bales.
Total crop of the U. States as above		3,524,242
Add—Stock on hand at the commencement of the year, Sept. 1, 1855—		
In Southern ports	76,814	
In Northern ports	66,378	
		143,192
Makes a supply of		3,667,434
Deduct therefrom—		
The exports to Foreign ports	2,954,606	
Less Foreign included	3,224	
Stock on hand Sept. 1, 1856—		
In Southern ports	18,383	
In Northern ports	44,157	
		3,013,922
Taken for home use—Bales		653,512
Quantity consumed by and in the hands of Manufacturers North of Virginia—		
1855–'6.....Bales		653,512
1854–'5		598,292

QUERIES.—Why are not American farmers as social, as rotund, and as hopeful as English? There may be several reasons, some beyond and some within human control. And why are not farmers' wives as robust, as strong-handed, as light-hearted, and as long-lived in this country as in that? If the causes are removable, it is of great importance to this and to coming generations that they be known. Will some philosopher give us the rationale for a future number, if he admits the facts, and if not, convince us that we are wrong; for we should like to think that this most important portion of our countrymen are *physically*, as well as intellectually and morally, equal, at least, to the same class in any other country. N.

WE repeat from last month, do not commence the winter with more stock than you can winter well. The winter may be mild, and it may be severe. Be ready for either. Badly fed cattle do not soon thrive afterwards. N.

Now is the last opportunity to put the buildings in warm condition for winter. If your house requires banking to keep the cellar from freezing—it ought not to, and we hope it does not—do not let the earth come in contact with the boards, but place a rough board between. Let the house be made warm in the first place; and then see that the horses, cattle, sheep, hens, pigs, and all the rest, have a warm place to sleep. N.

Mechanical.

THE UNION OF THE PLOUGH, THE LOOM, AND THE ANVIL, THE ONLY SOURCE OF GREAT NATIONAL WEALTH.

WE have so often referred to this topic, that we are almost suspicious that our readers will tire of seeing it in our pages. But we are quite sure they will never tire of seeing it in practice. Nor are we faithless as to the general adoption of our sentiments by the people of this country. Our warm-blooded, and now highly excited Southern friends, in their Quixotic plan of secession and "independence," have already confessed their own honest sentiments, when unbiased by party trammels, by declaring that they can create a market, and give value to their annual crops, and strengthen their own government, by calling in mechanics and manufacturers, and thus while they add essentially to their population, increase also their enonomic prosperity. See the *Charleston Mercury*. With such indirect confessions as to the true policy of a State, coupled with the convictions excited by the mere

logic of these discussions, who can doubt that such is the true policy of any people, and that without it, independence, in any substantial sense, is impossible!

But when and how shall this encouragement of the arts be exhibited? When does fostering these become oppressive to the agricultural interest? These are important questions. They lie at the very foundation of the subject, so far, at least, as its practical development is concerned.

As to the time, the answer is, obviously, whenever there is opportunity. A nation of slaves is impotent for all such instrumentalities. Our own country was once in such a condition. It was a penal offense to manufacture a hob-nail without the consent of our masters. The British Parliament forbade us even a privilege of that limited nature, in order to force us to sustain the mechanic shops of that country. Did our fathers live contented with that style of government? Did they sit down quietly, resting on their elbows, while their masters "at home" sent over to them, at their own prices, the products of the shops of England, wrought out by the hard work and at the starving prices submitted to by the laborer there, but sold here at such profits as were satisfactory to the lordly monopolists, the modern middle men, of that trading people, the merchants of England?

And is it any better, if now, the dupes of perverted English policy here, in our own country, changing their own position, but not changing the policy they adopt on this subject, themselves echo this same doctrine and reënact it upon our statutes? No! The thing is not changed. Prohibition is prohibition still, however the form of it is changed. A system of legislation which permits the British mechanic, sustained by the help of his government, by the system of laws, by the current of trade, and by the weight of national influence, so weighty on all subjects—a system which discourages and crushes the inexperienced, unassisted, and neglected American mechanic, no matter what its form, is oppression still, as essentially as it was before the Revolution, or when uttered by those *beyond* our own borders. The only change is for the worse. The oppression was then by foreign masters; now, it is by professed friends of our own kindred, our own brotherhood.

We have heretofore used sundry illustrations of this subject, in a form so familiar as to be plain even to the unlearned. Among these we would class the following, and beg, even to its simplicity, a careful consideration:

We remember that, in our boyhood, one of our school-books contained a dialogue carried on, upon the eve of setting out to establish a new colony, between the leaders of the enterprise and various applicants for admission into the company. Among these were the

tailor, and shoemaker, and spinner, and weaver, and tanner, etc., and all were gladly received, "because they could make themselves useful." Some of a different sort were rejected, as tending only to promote dissipation and vice.

Who would ever have thought of adopting any other principle in such decisions, unless biased by personal or party considerations?

We will suppose a community of farmers who have settled a new territory, divide the land among themselves, and so draw the lines as best to accommodate all parties. They commence business, but find it impracticable to be so far from their mechanics. Who would not be willing to modify the boundary lines of their farms, and dispose of their right to a lot, here and there, or even to *give* a few squares to sundry artisans and mechanics, for the sake of having the various trades in their immediate vicinity? But this is virtually levying a tax upon themselves on account of particular trades. And yet there is no bugbear about all this. No one's feelings are shocked at such proceedings. The propriety of such a course commends itself to every man's understanding. The only question is, to what extent it would be wise to go in presenting inducements to others to join your society, to identify their interests with yours, and to share in your burdens. And if a farmer offers certain pecuniary inducements to mechanics to settle in his neighborhood, let them come from what quarter they may, and he thereby saves money by the arrangement, we should like to ask, who pays this "tax in favor of particular trades"?

Let us again suppose that the colony of farmers to whom we have alluded, have established themselves in their new territory. As they have no mechanics, when their horses are to be shod, their wagons repaired, their clothes made, or when the services of any tradesman are demanded, they go to a certain island in the river, which flows near them. At every such visit, they consume half a day in going and returning. Each at first provided his own boat, but they afterwards found it more convenient to employ others who kept several boats for general convenience, to take them across to the island, charging a reasonable price for the service; and thus there sprang up a new and distinct occupation among them. The public were relieved thereby of much care and expense. These carriers, too—though they sometimes lost their boats, and now and then the men on board were drowned—on the whole were pleased with their new employment. They sold their lands, and devoted themselves entirely to its interests. Their fears, however, were somewhat excited by an unexpected circumstance which soon occurred.

It appeared that certain members of the community had had a conversation with some of the mechanics of the neighboring island, in which their removal into the territory belonging to the company had

been suggested, and the report presumed to say that they had already decided upon adopting that course. So earnest were these farmers upon the subject, (according to the rumor,) that, in the case of certain favorite artisans who had not the means of their own, they had even promised to pay the cost of removal out of their own pockets. Various opinions were given as to the probable result of the measure. Some believed that both farmers and mechanics would be ruined. These were chiefly the class of the boatmen. Some thought that the farmers would lose, while the mechanics would gain. Others believed that none would suffer any thing more than temporary inconvenience, the result of change of circumstances, and that in this view, the boatmen would seem to deserve the greatest commiseration. For a time they would be thrown out of employment.

The event proved these last the wisest. The boats were laid upon the bank, apparently to rot. But what followed? So great was the increase of the business of these mechanics, that they needed more help, and not a few of the carriers became artisans themselves, and thus secured safe, permanent, and lucrative employment. This increase of business roused up their energies, and led them involuntarily, almost, to enlarge their plans. Besides attending promptly to the calls of their own neighbors, they commenced the manufacture of tools and implements for farmers and mechanics, which they sent away to more distant markets. Hence, boats were again in demand, and men to manage them. The only change, as it turned out, in this department of trade, was in the kind of goods which they transported, the terminus of their voyages, and the direction of their cargoes, which formerly was homeward, but which now was outward. They now went much greater distances, carried larger freights, and received a corresponding increase in their profits. P.

AMERICAN INSTITUTE.

We continue our reference to the more noticeable inventions exhibited in the recent fair in the Crystal Palace. Circumstances compel us to be very brief in these notices, and to limit the space occupied by this department in this number, but we shall devote more space to them in the January issue, and shall endeavor to do justice to those whose inventions we describe. P.

Woodruff's Self-Acting Gate.—This has at least the merit of durability, and regularity in its action, for we have seldom seen it when it was not in motion, and it has not, in any instance, refused to yield on the application of the examiner's foot to the moving agent. It opens and closes easily and quickly, and commends itself for all avenues and the like, where there is frequent occasion for its being opened.

Marble-Sawing.—There are several machines, of recent invention, all de

signed for sawing taper blocks. They are called into being by an offer of ten thousand dollars for a saw that would accomplish such a result. One of these is Schultz's patent. In this, the sawing is performed with an endless band of iron or copper, continually running in one direction, working the sand through the whole length of the cut. The cutting edge of the saw can be kept in a rough state by means of a steel roller with teeth, pressed against the edge of the saw with a weighted lever.

Any number of saws can be arranged to cut a whole block of stone or marble into shapes or into obelisks.

Bull's Patent, for the same purpose, allows the sawing of any number of tapering blocks, at the same time, and also of "sections of circles, whether serpentine or straight." But as to the comparative efficiency of these two patents, we have no means of judging, other than the statements of the parties in interest.

Gas Stoves.—We have had occasion repeatedly to refer to the combustion of gas as a fuel, and the domestic manufacture of it for lighting houses. If gas can be used to heat our rooms, its manufacture at a cheap rate becomes of greater importance. That gas may be thus used is now an established fact. In the fair of the American institute, Mr. W. F. Shaw, of Boston, exhibited several patterns of stoves for warming rooms with gas, of very attractive forms and appearance, and of great efficiency. They have from one to four burners each. We have had one of these stoves for a year or more, and are satisfied that they are very desirable as a matter of cleanliness and of convenience, and, at a proper cost of the gas, of economy also, especially for occasional use. Four burners will warm a cold room in an hour or so, if of moderate size, and one or two will then preserve the temperature at the point desired.

Mr. Shaw has also smaller apparatus for heating flat-irons, boiling water, and other domestic purposes, that are of very great convenience and economy also, in ordinary domestic affairs. The stoves are to be seen in Broadway, at number 404.

Ormsby's Automaton Wood Sawyer and Splitter.—It is claimed by the inventor, that this machine is capable of sawing and splitting all kinds of wood and all kinds of knots, at the rate of a cord in fifteen minutes, attended by one man and a boy.

Four logs of wood may be placed in the machine at the same time, after which the machine is self-feeding, self-sawing, and self-splitting. A machine with two saws has been in use for months, it is said, without costing a cent for repairs, at the yard of the Metropolitan Kindling Wood Co., in this city. Knotty pieces of wood are somewhat troublesome to this, and to their splitting machines, but they are easily removed, if they are found to hinder the work.

Clark's Patent for attaching Legs to Piano-Fortes, Billiard Tables, etc.—The patentee regards this as a very valuable invention. He says: "In attaching legs to pianos, with the wooden screw, or any of the Metallic Fasteners now in use, great difficulty is experienced in getting the leg to its proper position; this, when the leg is carved, or has canted corners, is indispensable, and when the leg has been made right, it will not remain so, by reason that the bottom being made of kiln-dried pine, when exposed to a damp atmosphere, the side grain of

the bottom swells, and sets right into the end grain of the leg, so that it is almost impossible to remove the leg, with all the force that can be brought to bear on it, without injuring the leg, or Piano, or both. These difficulties are entirely obviated by the subscriber's new method, as by removing a wedge the leg drops away. This Fastener is also much cheaper than any other metallic fastening. It has been in use in one of our largest Piano-Forte Manufacturing Establishments for nearly a year, and is found to work very successfully.

Broughton's Cut-off Saw.—This machine is constructed with a sliding saw and stationary table, has no friction pulleys or hanger, and drives the saw in the simplest and strongest manner by the belts passing around none but the actual driving pullies. It will also cut off planks, boards, door-rails, panels, etc., perfectly square and true. The whole of the working parts are before the eye of the operator, and very accessible for the purpose of oiling, and very likely to attract his attention in case of accident.

Broughton's Door and Gate Spring.—This is small, neat, and compact, being attached to the door like a common butt, and entirely concealed from view when the door is closed. The springs, which are similar in principle to the spring of a gun-lock, are attached to the back of the flanges, and work in a small slot morticed in the edge of the door and jamb. Being out of the way and not exposed externally, they are not liable to get out of order. The action of the spring is so modified, that the further the door is opened the less the springs are moved, thus remedying the great objection to most springs. It is simple, cheap, durable, and effective.

Wright's Spring Bed-Bottoms were described and commended in our last issue, but we omitted to state that he uses similar springs for car seats, carriage seats, berths, and other similar uses. They may be seen at 1180 Broadway.

P.

Junior Editor's Table.

Here we are again, near the close of another month; and indeed we believe that twice

"Yon moon has filled her horn,"

since we had a familar chat with our readers. Truly, we are making progress of some kind, whether we know it or not, and this last month of a year which so lately commenced its first bright morning, how soon its progress will be ended. It almost saddens us as we think of it. But these months bear a constant record to all our readers how we are employed from day to day, and by-and-by the entire volume will be bound up, and

We will omit the rest of that sentence. Our readers pass judgment upon us monthly, and we have little occasion to complain of their injustice, (though we do wish some of them would pay a little more promptly,) and we hope they will ever find as just and as merciful a tribunal, when they shall discover that no month has passed over their heads without a record being made of what they have done, of which due examination one day must be made. But we are getting

too serious, too real, for a junior, and we only add that we hope that our *lunar* issues will one day be comparatively as clear and lucid as the sun, and all our friends, and patrons sharing alike in *all* the benefits of its instructions. This is no egotism in us, since we are the minority; one thing is certain, if we do not make our readers wiser, they are the occasion of much real happiness to us, and we regard them all, in no insignificant sense, as one family, and we could take each one by the hand as a brother, whatever side of whatever line his lot is cast, and whatever distance from us he may reside. This is no gammon.

But we are here alone, again, and we have half a mind to use hard words, when as of late, repeated applications to our wiser and older half are made, that he, should leave us alone, while he wanders away over farms or fields, directing one how to drain his lands, another how to cultivate them, and a third where to build his house, while a fourth applies for a lecture to the farmers of his neighborhood. During such absences, we can talk and consult only with the errand-boy, or a certain other more dubious character, not to be named in these pages polite, unless some casual visitor enters, which happens, sometimes just as the thread gets running smoothly, when, presto, as we rise to shake hands, and tell him how glad we are to see him, we drop our spool, and the whole skein gets tangled and twisted up, and for an hour after he has gone, we are diligently and delightfully occupied in "getting things to right," as some housewives call it. But never mind. "We" are doing good service both to the public and to ourselves, while he is instructing those who can appreciate a good lecture upon agriculture; and we will cheerfully submit to this partial interruption of our mutual consultations in the quiet of our own sanctum, if you will follow the example of some other communities, and procure and forward to us good lists of new subscribers, accompanied with a genuine bank-note, to form the basis of a regular monthly currency between us and them, through the new year to come.

The outer world has been in a busy, feverish turmoil during this interim, and few know little of the pleasure of the calm and quiet in our little sanctum all this while. It was comparatively like a summer sunrise, disturbed only, at times, by some morning's paper which passed before us for commendation or condemnation. We must say, however, that we don't know what political editors would do if they had not yet future space for repentance. But the battle is over, and the strife is—changed.

The scientific world is doing something for their race. For example, the metal *aluminum* is now manufactured in large quantities, at moderate prices, and will be used in many conditions where gold or platinum only has been applied. This is of great practical value. Another *savan* thinks he has discovered that the poisonous properties of paints do not consist in the lead, but in the turpentine. If so, that horrid disease, now so frequent, the painter's colic, may be guarded against effectually. A third ventures to say that he has learned how to discharge cannon and musket balls by electricity. Very good; but it would be extremely awkward if a shower, or natural electricity, and the like, should render his own "batteries" inactive in the midst of an engagement.

Lieut. Maury, the gentleman and the scholar, *sero in cœlum redeat*, has discovered that calms are less frequent in the South than in corresponding latitudes in Northern regions, and that there is more thunder also. (We suppose he does

not include the territory of the United States in these observations.) DR. SCORESBY has discovered how the compass may be preserved from irregularities on board iron ships. It is by keeping them above the reach of the influences of the metal. We think no one will dispute that; but the only inquiry will be, how high this will be, and whether it is always the same on the same ship. We should doubt whether this last point would be answered affirmatively. ARTESIAN WELLS, it is found, are capital contrivances for draining cities, and even large districts, where the soil is diluvial, tertiary, or of chalk, or jurassic rocks. Such drainage is said to be perfect and constant. THE FRENCH are trying to establish it, by law, that horse-flesh is first-rate beef. It is already common in the Paris market. We are quite willing to take this on testimony.

AN IMPORTANT TRIAL has just been had in the U. S. Circuit Court, in relation to Allen & Wells' Adjustible Cut-off, which has been in use upon the steamer Metropolis, of the Fall River Line. Our readers who are familiar with such machinery, will understand the point when we say that the decision declared the identity of this patent with that of Sickles. But we have prepared a short statement of this controversy upon another page. THE TELEGRAPH line between this city and Newfoundland is now completed, and is in a condition to be connected with the Transatlantic Company, which may, perhaps, be laid next summer. Our friend FISHER is also making some progress with his steam carriage for common roads. We scarcely know of any invention that would prove a greater boon to the entire public, just now, than this. Who will help him with ten, twenty, or fifty dollars, vested in the stock?

MUSICAL, AMUSEMENTS, &c.—In the line of amusement, our gay city is in rapid motion. The great king of that wonderful box of musical wires, the pianoforte, the great THALBERG, is astonishing every body. We have had great players here, but there has been no Thalberg. We are inclined to adopt the words of another, who had heard all the great orators of the day, except Daniel Webster. At last he heard him, too, and, on being questioned as to his comparative merits, replied, "When the sun rises, all the stars disappear." There is but one Thalberg in the world. We pity the cultivated mucisian who cannot listen to his wonderful touch. Many would be equally pleased, perhaps better, by the fastastics of the dancing master's fiddle. MADAME LAGRANGE, too, remains unequalled by no vocalist we have heard, in some respects, and eclipsed only, in our judgment, in opera, by the much-lamented Sontag. She is worthy of the warm reception she always receives. Extremes meet;—we have never laughed more heartily than when looking upon the manœvers of that *great curiosity*, Little Tom Thumb. He is at Barnum's Museum, acting the part of Tom Tit, in Dred, and other characters suited to his peculiar gifts. P.

IMPORTANT PATENT CASE.

A TRIAL of patent rights has just been had in the U. S. Circuit Court, testing the rights of certain parties in respect to certain forms of a cut-off, which was built by the Novelty Works for the steamer Metropolis, of the Fall River Line. The plaintiff, Sickles, claims that the use of this cut-off is an infringement upon his patent, or, to use the words of his attorney, "the controversy is not about a cut-off, nor yet about an adjustable cut-off—these things are old—but about an

adjustible cut-off capable of adjustment while the engine is in motion, and at all points of the stroke." Mr. Allen has claimed this as his own, and he was the real defendant.

It would appear that in this engine, two inventions are combined, the one closing the valve suddenly, and the other regulating the time of effecting the cut-off. Both are claimed as Sickles' invention, but the second only seems to have been in use in this engine in the exact method described in Sickles' patent. It was operated by different means, which were original with Mr. Allen. The defense rested on two grounds—1st, that "Sickles' invention is only applicable for tripping a valve, and that in this engine the valve is not tripped; and 2d, that the patent requires that the valve should be let down by a particular device, while in this engine the valve is eased into its seat by a different device. Allen claims under his patent of 1853, known as Allen & Wells' adjustible cut-off.

The plaintiff obtained a verdict of $750 for the use of this cut-off for sixty days. We should like to give a full history of this question, with illustrations, and may do so hereafter, with its general connections. P.

THE ATMOSPHERIC TELEGRAPH.

A SCIENTIFIC gentleman of New-Haven, Conn., writes the following article in reference to this project. It suggests that some difficulties which it must encounter are greater than we had supposed. It was addressed to the *Scientific American*, in reply to an article in that paper: P.

MESSRS. EDITORS:—A circular has been sent to me, from which it appears that an effort is being made to form a company for the purpose of constructing an atmospheric telegraph from Boston to New-York. In this circular an extract is given from the *Scientific American*, of which the following was the concluding paragraph:

"Suppose a line of two feet tube laid from Boston to New-York, it would contain about 4,000,000 cubit feet of air. Suppose twenty pumps of ten feet diameter and ten feet stroke are located at the Boston end, connected with the cylinder; these twenty pumps contain about 15,714 1-7 cubic feet. Suppose the pumps are worked twenty strokes in a minute, we have removed 313,285 2-7 cubic feet of air. Suppose the plunger was let in at New-York at the commencement of operating the pumps, and the pumps continued to run for fifteen minutes, in which same rate 4,714,279 2-7 feet of air would be removed, and the cylinder only containing 4,000,000, the plunger must reach Boston about as soon as this work could be performed, so far as we can see, and the same result the other way."

In respect to the *time* required to pump the air out of a pipe of the length, and under the circumstances named, the laws of nature have fixed a limit below which it cannot be reduced, whatever be the number, capacity, and speed of the pumps, for the pumps can remove air no faster than it is capable of flowing towards them, by virtue of its own inherent elastic force.

The laws which govern the flow of air by virtue of its own elastic force are given in the *American Journal of Sciences*, second series, vol. v. page 78, vol. ix. page 344, vol. xii. page 186.

Applying the principles which are developed in the articles referred to, to the case in hand, we shall arrive at the following conclusions:

1. If the number, capacity, and speed of the pumps be such as to maintain a semi-vacuum beneath the pistons, (a vacuum say of 7½ lbs. to the square inch), the air will flow in the pipe towards the pumps under half its natural density, and with a velocity of about 650 feet per second.

2. If the number of pumps be increased so as to maintain a greater vacuum

beneath the pistons than 7½ lbs. to the inch, the flow of air towards the pumps will not thereby be increased.

3. After the pumps are put in motion, thirty minutes must elapse before the effect will be felt at the other end of the pipe.

4. Supposing the plunger to move without friction or other resistance, and the air to flow in behind it without obstruction, thirty minutes more will be required to bring it to its destination.

5. Eight pumps of the capacity and speed named will be sufficient to maintain a semi-vacuum beneath the pistons, to drive which will require the power of 4000 horses. Twenty pumps will accomplish the work in no shorter time, and will require the power of 12,000 horses. * * *

NEW-HAVEN, CONN., Nov. 8th, 1856.

[The foregoing article is from the author of the articles referred to in the *Journal of Science.*]

Recent English Patents.

SELECTED AND PREPARED BY M. P. P.

THE MONSTER GUN OF THE MERSEY IRON WORKS.—The paper, on the manufacture of the monster gun, recently read before the British Association for the Advancement of Science, by Mr. Clay, the acting manager of the Mersey Works (under whose immediate superintendence this great feat of welding was performed), coupled as it is with Capt. Vandeleur's report of the practice of the gun, puts us in possession of some details respecting the manufacture of large masses of wrought iron, that are worthy of careful notice. We therefore give a summary of these papers. The manufacture of the gun by the Mersey Steel and Iron Company was undertaken, as is now pretty well known, to prove that what was beyond the power of the government of Great Britain to accomplish, was perfectly within the scope of a single firm. But besides this, in the then aspect of foreign affairs, it was an expression of the calm confidence of England, that, in her unequaled resources, her warriors possessed the means to cope advantageously with a nation whose foresight and skill had accumulated around them the defensive labor of ages, and enabled them to "put their trust in a rock." The failure of the English government to discover, through an inquiry and by experiments set on foot for the purpose, "the best means of ascertaining those properties of metals, and effects of various modes of treating them, which are of importance to the durability and efficiency of artillery," induced Mr. Clay, as the exponent of the Company's wishes, to offer to manufacture a large wrought-iron gun, as large or larger in the bore than the one undertaken at the suggestion of the Government by Mr. Nasmyth, and to present it to the nation, free of cost, and without any condition except that it should, after proving, be immediately used against the enemy.

But let us refer to the manufacture of the gun. To those who are acquainted with the special capabilities of the Mersey Steel and Iron Company, to work up large masses of wrought iron, it could be matter of no surprise that any forging undertaken by them, would eventually be successfully completed; but that at the first trial success should be obtained, was, to say the least of it, extremely creditable. A solid block of wrought iron had to be produced of a diameter exceeding by at least one foot any forging that had heretofore been made, and it was to undergo tests of the severest kind—the service of powder for the finished gun being more than double that used for the largest pieces of ordnance in the service. The chief points to be considered by the manipulator were to obtain sound weldings, to place the iron with its fibres in the proper direction for resisting the greatest strain, and to take care that while working one part of the forging another part was not wasting (under the action of the furnace fire) below the size required. As the operation of forging was necessarily a

tedious process, extending, as experience proved, over seven weeks, it was requisite to calculate beforehand the proper allowances for waste; but the chief difficulty to be anticipated was the heating of such a mass without burning or crystallizing it. In the paper above alluded to, Mr. Clay thus describes his operations: "The first thing necessary was to decide of what description of iron the gun was to be made, and I selected a strong clear iron puddled from the strongest pigs I could obtain, taking care that the iron should be worked as little as possible before it came to be put into the gun. A core was first prepared the full length of the gun, and of a certain diameter: this core, be it remembered, was meant to be bored out. A series of bars was then packed around this core, and heated and forged to the proper shape: another series of bars was packed over that, and heated and worked perfectly sound. It still required another layer of bars placed longitudinally, and even then was far from the size required. The forging, although then larger than any ever made, required to be augmented in its diameter at the breech by twelve inches, which was accomplished by two layers of iron placed in such a manner as to resemble hoops, and this being all welded sound, the forging of the gun was accomplished." Having described the mode of boring the gun, which operation presented no particular features of novelty, he concluded his paper by some remarks on the crystallization of large masses of iron by long-continued heating. "It was," he says "asserted, that iron by long exposure to great heat became crystalline in form, and weaker than cast iron, and that it was impossible to manufacture large masses of wrought iron without producing this result. It was also supposed that iron, by long heating in the reverberatory furnace, absorbed carbon from the grate, and became cast iron again. To prove the matter, I detached a portion of iron from an exposed corner of a large forging, in fact a piece of burnt iron having a crystalline appearance, and pronounced to be really cast iron. This I worked by means of the smith's fire, and found that, besides working under the hammer very well, it produced, when elongated by forging, an excellent fibrous iron, perfectly identical with the iron from which it was originally taken."

From this experiment Mr. Clay concludes that, "however iron may be crystallized by exposure to heat (or carelessly burnt, which is the same thing), its fibre may be restored by working either under the hammer or in the rolls."

The official report of Captain Vandeleur, gunnery inspector at the Royal Gun Factories, Woolwich, states that the monster gun consists of a single piece of wrought iron, with the exception of the trunnions; these are fixed to a large hoop, surrounding the body of the gun, shrunk on. This hoop is likewise kept in its position by a "securing" hoop.

The following are some of the chief dimensions: Length of gun, 15 feet 10 inches; diameter of base ring, 3 feet 7¼ inches; diameter of muzzle, 2 feet 3½ inches; diameter of trunnions, 3 feet 3¾ inches; diameter of trunnion hoop, 4 feet 2¼ inches; length of bore, 13 feet 4 inches; diameter of bore, 13.05 inches.

The present weight of the gun is 21 tons 17 cwt. 1 qr. 14 lbs.

The mass of wrought-iron of which the gun was made, before turning or boring, and without the trunnion hoop, weighed upward of 25 tons.

Fresh puddled iron was chosen for its construction, in preference to "scrap," as being less liable to flaws. Of this, upwards of 50 tons are said to have been consumed; so great is the loss of metal in the fire and under the hammer at welding heat.

The furnace employed is a reverberating one, the fuel coal, and the hammer that termed "tilt," this being preferred to Nasmyth's "steam hammer;" its weight is 15 tons. The most experienced men in Messrs. Horsfall's employ were chosen for the work, and the diameter is greater than that of any forging ever made by them.

The mode of operation was as follows: A number of small rolled bars, averaging about 6 feet, were first welded together, until the proper length was obtained—the form being circular, and diameter 16 inches. This is the usual mode of proceeding in making the propelling shafts in screw steamers. Two

layers of broader and thicker bars were then added—the first taking a diagonal direction to the right, the next crossing the first nearly at right angles, and taking a diagonal direction to the left. This increased the mass to upwards of two feet, the length being about 17; the remainder was made up by adding broad plates, in circles, at right angles to the axis. After each important addition, a "securing heat" was given to prevent flaws. The iron was not puddled from any particular brand, but was composed of a mixture of several, according to the experience of the firm. The forging was accomplished in seven weeks. In turning the exterior, no flaws were found, but in boring, one was found at each end; that at the muzzle was soon bored out; from that to within an inch of the end of the bore the forging proved perfectly sound. A serious flaw was then discovered in the center of the breech, extending several inches into the metal. As boring it out would have weakened the breech too much, it was determined to fill it up; and for that purpose a hole, slightly conical, 8 inches in diameter and four deep, was bored, into which a plug was driven with great force. Another trifling flaw extends from the edge of that plug to the side of the bore, 2 and a half inches in length by 3 and a half in depth; this is the only flaw now visible in any part of the gun. The turning was not carried on without intermission, and therefore occupied about two months. The gun was ready for trial about four months after it was commenced.

A rough carriage and platform, of a very suitable description, was constructed for it by Messrs. Horsfall, on which the gun was placed, at a point of the north shore of the Mersey, about nine miles north of Liverpool, near Formby lighthouse. To get it into position the gun had to be transported over the sand for 300 yards, which, notwithstanding the great weight, and the softness of the sand, was successfully accomplished.

The trial of the gun took place on the 22d inst., at the request of the owners. Two preliminary rounds with light charges were fired. After which the two proof rounds, with charges of 45 lbs. powder and a service shell filled with lead, and one wad. The gun having stood these tests in a most satisfactory manner, further experiments were carried on during the following day, for the purpose of ascertaining its range and accuracy.

Messrs. Horsfall were desirous of ascertaining what would be the effect of such large projectiles as their gun is capable of throwing, against the wrought-iron plates used in the construction of our floating batteries. One round was therefore fired against one of these plates. The dimensions of the plate were 3 feet 9 inches by 2feet 9 inches (weight 17 cwt.) by 4⅝ thick. This was placed at a distance of 120 yards from the gun, and was supported by nine balks of timber, 6 feet long by 14 inches square, against the end of which the plate was fixed. The timbers were secured by nailing cross-planks to them, and piling the sand around.

The gun was laid at point-blank, and loaded with twenty-five pounds powder and a solid shot, weight 282 lbs.: it struck the plate a little to the left of the center, and drove the portion against which it struck to a distance of 300 yards. One third of the plate was broken off; the shot was also broken and the fragments scattered around, some of them falling 200 yards to the left of the target: the timbers were driven to some distance.

On examination, after firing, the gun was found perfectly uninjured; the plug in the breech was slightly driven home, and the appearance of the flaw was unaltered. *The gun is now quite fit for service.*

Owing to the peculiar form of the traversing platform, much difficulty was experienced in altering the direction of the gun: this will account for the deflection, right and left. Had greater facility for traversing existed, I have little doubt that each shot would have struck a target 12 feet square, at a distance of 2000 yards.

This gun has been manufactured by Messrs. Horsfall, at an expense of £3500. As the condition on which they originally offered it to Her Majesty's government, that of being used against the enemy, can no longer hold good, these gentlemen are willing to put it at the disposal of the Government, for further experiment free of all expense. Their only wish is, that Her Majesty's government should declare the gun to be fit for service, and by so doing, acknow-

ledge that Messrs. Horsfall have been successful in their untertaking, and have accomplished that which, by the scientific world, has hitherto been deemed impracticable—the construction of a sound 13-inch wrought-iron gun.

AN IMPROVED SAFETY-VALVE. By Mr. JOHN RAMSBOTTOM, of Manchester. —Upon the man-hole cover two brass pillars were bolted and bored out at the upper ends to serve as seatings for the conical valves in the ordinary manner. The valves are loaded by the cross-bar, which is elongated at one end, to form a handle, to enable the engine-man to ascertain the working condition of the valves and the approximate pressure of the steam. To this bar is attached, at a point mid-way between the valves (when these are of equal size), and rather lower than the points which press upon them, a helical spring of sufficient strength to resist the pressure upon both valves, and the pressure is regulated by nuts and a bridle that holds down the spring. To provide against the valves being blown away in the event of the spring breaking, the lower part of the cross-bar is passed through a slot in a guard, pivoted into the tops of the main pillars; and a shoulder made on the bridle, being unable to pass through the slot, prevents the valves being blown away. To compensate for the very slight difference that may arise in some cases (in the valves of large steamboats for instance), between the distance of the centers of the valves and the distance of the points of the cross-bar, owing to the greater expansion of the former, the writer proposes to make one of the bearing points upon the cross-bar loose; this is not necessary, however, where the dimensions are small.

A similar arrangement may be adopted with the spring sunk in a well or recess in the man-hole cover, and the chance of failure may be provided against by a cover plate corresponding to the guard above mentioned. It is evident that under any form the valves constructed upon this principle cannot be easily tampered with; and a brass funnel may be placed over them in the ordinary manner.

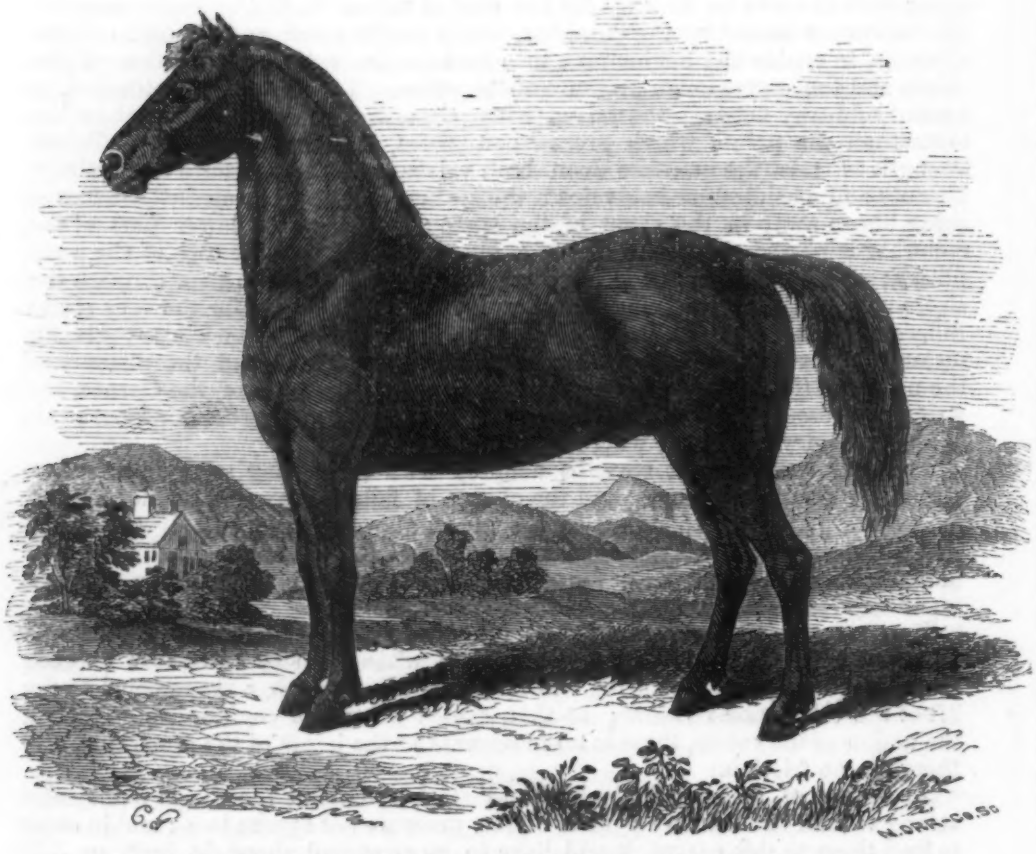
The valves being equally loaded and of equal size will be bodily and simultaneously lifted together with the cross-bar, when the steam-pressure exceeds the proper limit, and the spring will be elongated through a range equal to the lift of the valves and no more; so that, except when the engine-man is testing the action of the valves, there is no movement in the joints of the apparatus, and therefore no friction.

A spring of five-eighths-inch round steel, and about 7 coils, is sufficiently strong to load two 3-inch valves to 80 lbs. pressure per square inch; and in order to load them to this extent, it will have to be stretched about 1¼ inch, or .218 inch for each successive increase of 10 lbs. pressure per square inch.

The new valves are found be very sensitive, having such freedom of action as to get into a state of vibration, producing in some cases a musical note when at the point of blowing off; and they allow the steam to blow off more freely than other safety-valves, under a given excess of pressure. The arrangement of the two valves under one lever is the same as in Mr. Fenton's safety-valve, but the object had been to increase the lift of the valves—making it equal to the full extension of the spring, and also to dispense with the spring balances. The point of attachment of the spring is rather below the level of the two points bearing on the valves; so that, in the event of one valve lifting before the other, it is overloaded, the other being proportionately relieved; this tends to secure their simultaneous action.

THE BEST ICE CREAM.—Our best confectioners, in making their creams, use about 8 ounces of loaf sugar to every quart of cream. To flavor 4 quarts of cream with vannilla, requires a bean and a half boiled in a little milk. If with lemon, the outer rinds of three lemons should be grated very fine, or six drops of oil of lemon for every four quarts of cream. Four quarts of good cream will make seven quarts of ice cream, if well beaten; while thin, milky cream will increase but little, and never become perfectly smooth. The ice should be fine, and put in the freezer with alternate layers of salt—say about two quarts of salt to an eight quart freezer—the ice and salt as they work down to be filled up.—*American Farmer.*

Miscellaneous.



MEMOIR AND DESCRIPTION OF THE JUSTIN MORGAN, AS PORTRAYED ABOVE.

THE original, or Justin Morgan, was about fourteen hands high, and weighed about nine hundred and fifty pounds. His color was dark bay, with black legs, mane and tail. He had no white hairs on him. His mane and tail were coarse and heavy, but not so massive as has been sometimes described; the hair of both was straight, and not inclined to curl. His head was good, not extremely small, but lean and bony, the face straight, forehead broad, ears small and very fine, but set rather wide apart. His eyes were medium size, very dark and prominent, with a spirited but pleasant expression, and showed no white round the edge of the lid. His nostrils were very large, the muzzle small, and the lips close and firm. His back and legs were perhaps his most noticeable points. The former was very short, the shoulder-blades and hip bones being very long and oblique, and the loins exceedingly broad and muscular. His body was rather long, round and deep, close ribbed up; chest deep and wide, with the breast-bone projecting a good deal in front. His legs were short, close jointed, thin, but very wide, hard and free from meat, with muscles that were remarkably large for a horse of his size, and this superabundance of muscle exhibited itself at every step. His hair was short, and at almost all seasons soft and glossy. He had a little long hair about the fetlocks, and for two or three inches above the fetlock on the back-side of the legs; the rest of the limbs were entirely free from it. His feet were

small but well shaped, and he was in every respect perfectly sound and free from any sort of blemish. He was a very fast walker. In trotting, his gait was low and smooth, and his step short and nervous; he was not what in these days would be called fast, and we think it doubtful whether he could trot a mile much, if any, within four minutes, though it is claimed by many that he could trot it in three.

Although he raised his feet but little, he never stumbled. His proud, bold and fearless style of movement, and his vigorous, untiring action, have, perhaps, never been surpassed. When a rider was on him, he was obedient to the slightest motion of the rein; would walk backwards rapidly under a gentle pressure of the bit, and moved side-ways almost as willingly as he moved forward; in short, was perfectly trained to all the paces and evolutions of a parade horse; and when ridden at military reviews, (as was frequently the case,) his bold, imposing style, and spirited, nervous action, attracted universal attention and admiration. He was perfectly gentle and kind to handle, and loved to be groomed and caressed, but he disliked to have children about him, and had an inveterate hatred for dogs, if loose always chasing them out of sight the instant he saw them.

When taken out with halter or bridle he was in constant motion, and very playful.

ORIGINALITY.—A subscriber—one only, so far as we know—desires more editorial and less selected matter—rather flattering to us, as it implies, in his mind, a higher estimate of our articles than we should dare put upon them, in comparison with our selections, which we make with great care and pains-taking, often with more labor even than that of writing, and that from several hundred of the very best writers in the world. We hope our own articles may be found readable and instructive, but we are not so vain as to wish them to push out all others. We want to avail ourselves of the best thoughts of our cotemporaries, as they do of ours, not for the purpose of shirking the labor of writing, but for that of giving our readers a richer and more varied treat. That is not the best journal, which is written wholly by its own Editor, draining, it may be, a shallow brain to the quick, and leaving little time for study, or, what is more important, for consultation with the working farmers at their homes; nor that which is concocted by a set of paid writers, so paid by the yard, that the longer's the yarn the more's the pay; but that whose editor writes well and selects better, *learns* before he teaches, when he has had his say, lets his cotemporary journalists have theirs—lets them advertise their wares in his journal, yes, generously, by selecting their most tempting articles—thus making the corps editorial a brotherhood, each working for the benefit of the readers of all, and making each journal a reflection, not of one or a few, of many able minds. On these principles the *Plough, Loom and Anvil* has been conducted from the beginning; and its back volumes are among the very best agricultural books yet published. They would not lie on our shelves another week if their real value was known. Whether we shall be able to make the work still better than in those palmy days of its first Editor, the lamented Col. Skinner, remains to be seen. We shall try. N.

HUSBAND POLITENESS.—"How seldom do we meet with people, united by the intimate relations of husband and wife, brother and sister, parent and child, who are habitually courteous—that is to say, unselfish towards each other. Most unusual is it to meet a husband and wife whose manner towards each other is at all what it ought to be. All the formality assumed in company does not veil the disrespectful and contemptuous familiarity of more private life. We have seen many men who would throw away cigars at the approach of a strange lady, but who would never hesitate one moment to make their wife's sitting-room smell like a bar-room; and though we

should think it a badly arranged home, where no arrangements are made to keep people's indulgences from inconveniencing each other, and her a bad wife, who allowed no place for cigar-smoking, still we do not consider that he acts with true gentlemanly spirit towards his wife who will give the whole house a smell of stale tobacco, rather than walk ten steps, even if his wife be so truly a lady, and acts in so genuine a spirit of self-sacrifice, that she does not let it be seen that she is sacrificing."—[Ex.

If a lady, with whom you are acquainted, and whom you know to possess a fair all lowance of candor and sincerity, tells you, that the smoke of a fine cigar, or of a clean pipe even, is not offensive to her, you may believe her; for this is not disagreeable to all; but is, on the other hand, to many a source of pleasure. Children are seldom annoyed by fresh tobacco smoke, especially if it come from the lips of those they love The time is fresh in our memory when we used to climb upon grandpapa's knees, and the more he smoked about our face and ears the louder we laughed. But if a lady tells you that the smell of stale tobacco—of a room where smoking is habitual—is not annoying, and mortifying too, if in her own house, however candid and sincere she may otherwise have shown herself, you need not believe her. It cannot be that the dead, musty odors of a smoker's apartments are agreeable to any one; and if a lady should tell us that they are so to her, we should suspect—the ladies must pardon us—that she fibs a little. We would sooner be where fifty smokers *are* than where one *has been*.—Eds. P. L. & A.

Strawberry Beds.—If you will as soon this month as convenient give your beds a good dressing of short, well-rotted stable manure, broken up finely—as solid lumps may press too heavily upon the plants—previously applying a tolerable sprinkling of wood ashes, if at hand—the plants will be preserved in fine, vigorous health, and will take a very early start when the season again opens. In the spring, very little of the manure, if any, need be removed—the plants will strike through the covering energetically, *and the top dressing will act as a mulching, preserve the ground in a properly humid state, and prevent the growth of weeds.* We follow this plan with entire success, and do not remember seeing a single weed in any of our beds the past season.—*Germantown Telegraph.*

We would suggest, with great respect for the Editor of the *Telegraph*, that, if the three-fourths of the manure to be so applied with wood ashes, were well cured swamp muck, the dressing would be cheaper, and quite as good for the purpose. Few are aware that well-cured swamp muck (that which has been up and washed and sunned six months or a year) is almost precisely the same thing, as well-rotted barn manure, with the exception of such active salts as are contained in the manure, but not in the muck. In other words, well-cured muck *with* ashes, is about the same as well-rotted manure without them. If, then, a mixture of manure and muck were applied, instead of all manure, a few more ashes would be required, and then the application would be veritably the same thing, but less expensive.

The Necessity of Drought, and its Benefits.—The State Agricultural Chemist of Maryland, Mr. Higgins, published a paper showing the necessity of droughts to replenish the soil with mineral substances, carried off to the sea by rains, and also taken by the crops, and not returned by manure. These two causes, also, in operation, would, in time, render the earth a barren waste, in which no verdure would quicken, and no solitary plant take root, if there was not a natural counteraction by drought, which operates to supply this waste in the following manner: During dry weather, a continual evaporation of water takes place from the surface of the earth, which is not supplied by any from the clouds. The evaporation from the surface creates a vacuum, so far as water is concerned, which is at once filled by the water rising up from the subsoil of the earth; the water from the subsoil is replaced from the next strata below; and in this manner the circulation of the water is directly opposite that which takes place in wet weather. With this water also ascend the minerals held in solution, the phosphates of lime, carbonate and silicate of potash and soda, which are

deposited in the surface soil as the water evaporates, and thus restore the losses sustained as above stated. The author of this theory appears to have taken considerable pains to verify the fact by a number of interesting experiments. The subject is worthy the attention of men of leisure and of education, who pursue the rational system of blending chemistry with agricultural science.

A just inference from the above is, that irrigated lands will deteriorate, unless the water be very rich in mineral matters; and even in that case it can hardly fail to exhaust the land, if the irrigation be continued the whole year. It should be suspended at times, that the upward flow of water, spoken of by Mr. Higgins may take place, bringing up the soluble salts from below. N.

CANADA THISTLES.—These, cut early, make an agreeable nutritious fodder, especially for horses in winter; and therefore their growth on a farm is not altogether a loss: but in cultivated grounds they are one of the worst pests with which the soil can be afflicted. How can they be eradicated? Salt sown so thick as to kill every thing else, will kill them; but by this system the use of the ground is lost for one year. Sowing the land early to buck wheat, so that this, which grows fast, may overtop and smother the pests, will kill them. This will also stifle witch grass to death. Or, harrowing or plowing the land several times during the season, particularly if it proves a dry one, will in time eradicate them.

Above all, don't let one go to seed on private ground or in the public highways. Cut them down now.—*Drew's Rural Intelligencer.*

Just so; if they have already grown, make the best possible use of them, but don't let any more grow, either on your land, or on the adjoining highway, unless you mean to be a bad farmer and a bad neighbor. N.

THE laboring classes sustain all others. The fruit of their toil is the wealth of the nation. Our commerce, our manufactories are equally dependent on them.

If your college (agricultural and mechanical) needs a hundred thousand dollars to begin with, your farmers have but to order the money appropriated, and it will be found. Let your societies, your country societies, but once earnestly take the matter in hand, and it will easily be accomplished.

To whom do your State funds belong? Who pay the taxes? Who are the most numerons class in your State? And I may ask, who have been the last to be served in their great interests from the public treasury?

The response is at hand. And will this state of things continue? Farmers must answer NO.—*Judge Jessup.*

TRUE.—A family is a State in miniature. Every work of necessity performed by its members, increases its wealth. A State, manufacturing and producing all the necessaries of life, is in a healthy condition financially and morally. It is wealthier, by retaining in the hands of her people the money paid for articles imported. Thus we see that labor is wealth. Every family is wealthy in proportion to the ability of its several members, collectively to produce all that may be necessary for its wants.—*Ex.*

So is every State; and it is a primary duty of every government to hasten, by all judicious means, such a result. N.

BEAUTIFY YOUR HOME.—Every man should do his best to own a home. The first money which he can spare ought to be invested in a dwelling, where his family can live permanently. Viewed as a matter of economy, that is important, not only because he can ordinarily build cheaper than he can rent, but because of the expense caused by a frequent change of residence. A man who early in life builds a home for himself and family will save some thousands of dollars in the course of twenty years, besides avoiding the inconvenience and trouble of removals. Apart from this, there is something agreeable to our better nature in having a home that we can call our own. It is a form of property that is more than property. It speaks to the heart, enlists the sentiments, and enobles the possessor. The associations that

spring up around it, as the birthplace of children—as the scene of life's holiest emotions—as the sanctuary where the spirit cherishes its purest thoughts, are sure as all value; and whenever their influence is exerted, the moral sensibilities are improved and exalted. The greater part of our happiness of to-day is increased by the place where we were happy on yesterday, and thus, insensibly, scenes and circumstances gather up a store of blessedness for the weary hours of the future! On this account we should do all in our power to make home attractive. Not only should we cultivate such tempers as serve to render its intercourse amiable and affectionate, but we should strive to adorn it with those charms which good sense and refinement so easily impart to it. We say easily, for there are persons who think that a home cannot be beautified without a considerable outlay of money. Such people are in error. It costs little to have a neat flower-garden, and to surround your dwelling with those simple beauties which delight the eye far more than expensive objects. If you will let the sunshine and dew adorn your yard, they will do more for you than any artist. Nature delights in beauty. She loves to brighten the landscape and make it agreeable to the eye. She hangs the ivy around the ruin, and over the stump of a withered tree twines the graceful vine. A thousand arts she practices to animate the senses and please the mind. Follow her example, and do for yourself what she is always laboring to do for you. Beauty is a divine instrumentality. It is one of God's chosen forms of power. We never see creative energy without something beyond mere existence, and hence the whole universe is a teacher and inspirer of beauty. Every man was born to be an artist so far as the appreciation and enjoyment of beauty are concerned, and he robs himself of one of the precious gifts of his being if he fails to fulfill this beneficent purpose of his creation.—*Southern Times.*

SALMAGUNDI.

Webster defines this word;—1. "A mixture of chopped meat and pickled herring, with oil, vinegar, pepper and onions; 2. A mixture of various ingredients." In its last sense, we use it as the heading of the following original and selected matters.

Drainage.—Of the importance of drainage as a means of meliorating the soil, most persons are not sufficiently aware—none but those who have witnessed the good effects of this process, can properly appreciate its great benefits; for it has been well and truly said, that by draining the soil is kept from being too wet, and also preserved from the effects of drought—that it is warmed by the summer showers, and escapes the chilling influence of excessive moisture, and is kept from being baked by excessive heat—that it is percolated by currents of the all-pervading air, laden with treasures of food for the plants, while at the same time the cutting blasts of wind pass harmlessly over, without drying out all the moisture, and producing excessive cold by evaporation.—*American Farmer.*

The Selma (Ala.) *Gazette* states that M. Dillard of that place, has grown 80 acres of "Boyd Cotton" this season, the yield of which has been very great—100 well-formed bolls being formed on a single stalk, on an average.—*Ex.*

The Crops in France.—The merchants of Marseilles, it is said, having ascertained that the wheat harvest will not be sufficient for the home consumption of all France, are beginning to suggest to the government, through their local papers, that a repeal of the corn laws would be indispensable, or at least an extension of the imperial decree, which permits the free importation of corn, and which expires on the first of January next. Although two millions of hectolitres of wheat have been imported within two months, through the port of Marseilles, it would be impossible by the end of the year to make up the great deficiency which exists.—*American Farmer.*

Cisterns, and How to Make them.—We have had several inquiries relative to the art of making cisterns. Where bricks are to be had they are easily constructed with the aid of water-lime. The mortar should be composed of one part water-lime to two parts of good sharp sand, and made in such quantities only as can be immediately used. Good cisterns of a moderate size can be made easily from inch and a half plank, well jointed together, hooped like a barrel, overlaying the bottom with coatings of the cement until it is water-tight. Where the soil is loose, and the plank would be liable to leakage, a coating of the mortar, if rightly put on, will render the cistern thoroughly tight. In building cisterns with filters, it is necessary to have a water-tight division in the cistern, on one side of which the supply of water is re-

ceived. At the bottom of this division, is a thick layer of clean sand through which the water has to pass to get to that division from which the water is drawn. The art of making these filtering cisterns is simple, and they can be easily constructed by any good mechanic.—*Mich. Farmer.*

Dioscorea Batatas.—*Eds. Prairie Farmer*: I obtained some of the Chinese potato (sections of the root) last Spring, of Elwagner & Barry, at six dollars per dozen. I prepared the ground by spading and thoroughly pulverising to the depth of two feet, and planted them the last of April, covering two inches. They came up about the tenth of June. In the course of the summer the vines made a growth of some two feet. I tried layering them to produce tubers—covered them carefully, watered freely, and kept in good condition, but could not possibly induce them to strike root. The frost of Sept. 20th entirely killed the vines. I have now just taken the roots from the ground. In length they are from 10 to 20 inches. They are the largest at the bottom, and taper regularly to the top. The largest diameter was one inch at the bottom, and one-sixth of an inch at the top. We cooked one of them with pink-eyes of much larger size. The pink-eyes baked in 35 minutes, the Chinese potato in 60. In flavor it somewhat resembles the Irish potato; but is not, in my estimation, at all to be compared with the best varieties. It leaves a slightly disagreeable pungent sensation in the mouth. Shall the great Dioscorea be pronounced a humbug? I will not pretend to decide that question, Messrs. Editors; but I am inclined to think, from my limited experience, that it has strong claims to be placed in that category. Possibly I may undervalue it. Let me have the experience and opinions of others.

J. P. Eames, in *Prairie Farmer.*

Mendota, Ill., Oct. 20, 1856.

☞ We desire the Prairie Farmers all over the land to take particular notice of this article, and if any of our readers have had similar or contrary experience, we shall be happy to publish it. We have no desire to condemn any thing that is really meritorious, nor are we disposed to wrong any one, but we *are* disposed to mete out *justice* to all who have to do with the interests of the farmers of the West. Justice will *injure* no one.—[Eds. *Prairie Farmer.*

This is right. Will those who have tried the Dioscorea give the facts to us also. We wish justice to be done to the farmers of the West, and everywhere else, and to all.—Eds. P. L. and A.

A New Species of Corn.—We have made trial of the Wyandot Corn, at Roslyn, on Long Island, the present season. About a quarter of an acre was planted from a single ear received from Mr. J. C. Thompson, of Tompkinsville, Staten Island; a grain in each hill. The soil was not entirely suitable to this kind of corn, or, indeed, any other, with the exception of about one quarter of it, where there was a good rich mould. In that part, also, the mice did considerable damage by eating the grains before they came up. The experiment on the more fertile part of the spot planted with this corn was perfectly satisfactory. From each grain sprouted from four to eight or nine vigorous stalks, ten or twelve feet in height, on each of which was one and sometimes two ears. The corn will ripen well this season. From our experience of its cultivation we should think it a variety worth trying extensively in this neighborhood, and have no doubt whatever of its being a most valuable and desirable sort for those parts of the United States where the corn season is a little longer than here, on account of its extraordinary power of reproduction, yielding, as it does, eight or ten ears to a single grain committed to the earth.—*N. Y. Evening Post.*

All leguminous plants, to which the clover belongs, are always greatly benefited with a sprinkling of Plaster of Paris over the leaves, when wet from dew or rain; and it will, therefore, be very beneficial on the clover.—*South Cult.*

Fast Horses and the Fast Use of Them not Exactly the Thing for Farmers.—A valued correspondent, one who we presume has no objection to a little fun and frolic in an innocent way, certainly not a Puritan nor a Blue Light, says:

It has seemed to me of late, that there is great danger of the attention of our farmers being diverted from their legitimate objects, by the encouragement given to *fast horses*, and their usual accompaniments. *Fast horses* are not useful to the farmer, and the *fast use* of them is not creditable to any one.

Our own Matters again.—A liberal response to the proposition in our last for the formation of clubs of three or more, to take our journal at $2 00 each through an agent, or at $1 50 each if some of the club will collect and forward the money without charge to the rest, induces us to repeat the proposition, and to request our readers to lay it before their neighbors and friends. This they can do in their ordinary intercourse, without consuming much of their time, and greatly to our advantage, for which they shall not fail of our hearty acknowledgments.

This implies no change in our prices. They are still (for the current volume) $3 00 for a single subscriber, $2 50 each for two, and $2 each for three or more. But it throws the benefit of a commission in favor of subscribers, who choose to avail themselves of it, by paying us each $1 50 directly, instead of paying $2 00 each to an agent, and leaving us to pay him a quarter of the amount.

The evenings are now long, and are growing longer. Will our readers consider the benefit of such a journal as *The Plough, Loom and Anvil* in their neighbors' houses at this time, and jog them on the subject.

Book Notices, Etc.

Morgan Horses: A Premium Essay, *on the Origin, History, and Characteristics of this remarkable* American Breed of Horses, *tracing the pedigree from the* Original Justin Morgan, *through the most noted of his progeny, down to the present time; with numerous portraits; to which are added Hints for Breeding, Breaking, and General Use and Management of Horses; with practical directions for training them for Exhibition at* Agricultural Fairs. *By* D. C. Linsey, *of Middlebury, Vt.* New-York: C. M. Saxton & Co., Agricultural Book Publishers, No. 140 Fulton street. 1857.

On another page will be found a portrait and a brief description of the celebrated Justin Morgan, which we esteem well worth the space they occupy, as means of enabling the reader to judge of the characteristics of a good horse.

The work indicated by the above title is one which has been long wanted, not only by horse breeders, but by all who own and use horses, by reason of its plain, useful directions for their management. The best commendation we can give of it is to say that it received the first premium of the Vermont State Agricultural Society, and to copy its table of contents, as we do below, assuring the reader that every chapter is in our opinion, well executed.

I. The Most Esteemed Races of Horses, and the Kinds of Service to which they are Adapted. II. Contrast between the Kinds of Service Required of Horses Formerly, and at the Present Day. III. Description of the Kind of Horses most sought for in the Principal Markets of the country. IV. Peculiar Adaptation of the Morgan Horse to the Road and General Use. V. Origin of the Morgan Horse. VI. Memoir and Description of the Justin Morgan. VII. History and Description of the Stallions sired by the Justin Morgan. VIII. General Description of the different Families and their Distinguishing Characteristics. IX. Present Condition of this Stock in Vermont. X. Performances of Morgan Horses; the Demand for them, and their Present Value as Indicated by Sales. XI. Hints as to the Best Methods for Improving and Perpetuating the Breed. XII. Hints in Relation to Breaking and Driving. XIII. The Proper Manner of Feeding and Driving upon the Road. XIV. Hints to Purchasers of Morgan or other Horses. XV. Pedigrees and Description of Stallions.

The Illustrated Annual Register of Rural Affairs and Cultivator Almanac for 1857, *embellished with one hundred and thirty Engravings.* Luther Tucker & Son, 307 Broadway, Albany, and C. M. Saxton & Co., 140 Fulton street, New-York.

This is the third No. of an excellent series. It contains, like its predecessors, a great amount of matter on farming, gardening, fruit-growing, and other subjects, interesting to all cultivators, whether of a large farm or a ten-foot garden, and almost equally

valuable to every family wishing to learn something of those rural affairs and interests, about which no one living should be ignorant.

THE DOG AND THE GUN; *a few loose Chapters on Shooting, among which will be found some Anecdotes and Incidents.* By JOHNSON J. HOOPER, of Montgomery, Ala. C. M. Saxton & Co., Agricultural Booksellers, 140 Fulton street, New-York.

We do not think much of this book, as compared with many of great value published by the same firm. But then that is owing to our own oddity, and is no fault of the book. The book is a good one in its way; and teaches in an agreeable style a great many things about gunning, hunting, training dogs, etc., etc. Let all buy it who want a book on those subjects. We have no objection to boys hunting, if they won't kill the birds that would otherwise destroy the insects which ruin the farmer's crops. If they do that—we won't say what till we get cool.

ADDRESS OF HON. WM. JESSUP before the New-York State Agricultural Society, at Watertown, Oct. 3, 1856. Published by the Society.

This is a valuable production, practical, instructive, containing some remarkably fine paragraphs, as will be seen by our extracts in another part of this number. It is all good; and our only fault with it is, that it is not *as good as* Judge Joseph *could* have made it.

GLANCES AND GLIMPSES, OR, FIFTY YEARS SOCIAL, INCLUDING TWENTY YEARS PROFESSIONAL LIFE. By HARRIET K. HUNT, M.D. Boston: John P. Jewett & Co. 1856. 12mo, 418 pages.

We have long had female authors and female preachers, and now have female doctors; and if in the last two positions women will do as much for the race as they have in the first, no one can fail to give them reverence. But we see no evidence of such promise. Female autobiographies are not unknown. The book before us adds to the number. To the friends of these writers, such works must be suggestive of many pleasing remembrances, and be highly valued. Beyond this circle, they are but little esteemed, unless the writer is a public character, in which the public have an interest. As to this book, we have time only to glance at it. The author seems full of religious sentiment, and now and then, at least, drops a beautiful thought. She repeats the story of the wrongs of woman, and has some little reason for it. But it is not true that "she is denied a finished education," nor is it true that she generally avails herself of the advantages she actually possesses. Those who believe that the practice of medicine belongs alike to both sexes will take a lively interest in this history. On this question we have our own opinion. We often see reason to be offended at the want of true feminine delicacy, but we as often see a false delicacy that is not even a shadow of the true, and in the multiform necessities which demand professional advice in the practice of medicine, we could give statements, from our friends in the medical profession, which show that those of the best reputation are not, in general, the most troubled in imparting the information the physician ought to know. Opinions here may vary, however. But if any, of either sex, wishes to become a physician or surgeon, we know of no reason why any mortal should object. One's pursuit in life ought surely to be chosen freely and not by compulsion just as one would choose a wife or a husband. We have seen women that would make capital policemen. Many would make themselves distinguished in either of the professions. It is a mere matter of taste. Ladies, walk in. The door is open.

THE COMMUNION SABBATH. BY NEHEMIAH ADAMS, D.D., pastor of the Essex-street church, Boston. John P. Jewett & Co., Boston. 12mo, 208 pages.

The appearance of this volume, in its typography and binding, is honorable to its publishers and to American art, and in these respects it deserves a place among the keepsakes of the holidays. Before opening its pages, we were prepared to find an

excellent book, for the author's well-known ability and peculiar style of writing, is specially fitted for such topics. An examination of the book cannot fail to satisfy every reader of the correctness of our opinion. It is one of the gems of the season.

THE BIBLE HISTORY OF PRAYER, *with Practical Reflections.* By CHARLES A. GOODRICH. John P. Jewett & Co., Boston; Jewett, Proctor & Worthington, Cleveland, Ohio; and Sheldon, Lamport & Blakeman's, New-York. Pp. 384, 12mo.

This is a Bible History of the intercourse of believers with heaven through a space of four thousand years, interspersed with various historical facts, and enriched with illustrative anecdotes. The conception of the author—to make the eminently pious of other ages our teachers by example—is a good one, and well has he executed it. The book will be likely to become a standard work on that subject.

SABBATH TALKS ABOUT JESUS WITH LITTLE CHILDREN. By the author of the Mothers of the Bible. John P. Jewett & Co., Boston. Pp. 139, 18mo.

This is what its name imports—a book for small children--and is well adapted to benefit that class. Some of the points familiarly illustrated are, that Jesus was obedient, truthful, meek, patient, faithful, persevering, courteous, kind and considerate, prompt and punctual, prudent and careful, pleased not himself, went about doing good, loved the Bible, was prayerful. It will not injure children of a larger growth.

MARTIN AND JOHNSON'S SPLENDID QUARTO EDITION OF SHAKEPEARE, is nearly completed. We have quite overlooked it, in our increased cares, of late, but we perceive that forty-four numbers in all, have been received, and others, we understand, are already published. There is no edition so handsome as this, or so elegantly illustrated, in our market. We commend it to the lovers of this great dramatist through the whole country. Price 25 cents a single number.

List of Patents

ISSUED FROM THE U. S. PATENT OFFICE FROM SEPT. 30 (THE TERMINATION OF THE PREVIOUS LIST) TO OCTOBER 28.

Hubbard Bigelow and Mortimer M. Camp, New-Haven, Conn., improved ring bolt for ships' and boats' tackle.

J. F. Boynton, Syracuse, improvement in soda fountains.

Wm. O. George, Richmond, Va., improvement in bumper arrangements for uncoupling railroad cars.

George W. Childs, Liberty, Pa., improvement in vegetable cutters.

Joel W. Cormack, Quincy, Ill., improvement in smut mills.

Cyrus Chambers, Jr., Kennett Square, Pa., machine for folding papers.

Wm. Drips, Coatesville, Pa., improvement in harvesters.

Elias A. Eliason, Georgetown, D. C., improvement in the construction of hide frames in tan vats.

Wm. M. Ellis, Washington, improvement in buoys.

Lewis M. Terry, Chicopee, assignor to James T. Ames, of same place, improvement in hose coupling.

Geo. Gilbert, Westville, Conn., for fly-trap.

Benjamin F. Field, Beloit, Wis., improvement in machines for mixing mortar.

David Allen Goodnow, Baldwinville, Mass., improvement in attaching scythes to snaths.

Augusta Jouan, San Francisco, arrangement of elastic plate paddles for steam vessels.

Edwin Kilburn, Artemas Kilburn and Cheney Kilburn, Burlington, Vt., improved method of bending wood.

Israel Kinsey, Hoboken, N. J., improvement in feeding pulp to paper-making machines.

Samuel Krauser, Reading, improved method of measuring fluids while drawing.

Wm. Lewis and Wm. H. Lewis, New-York, assignors to Malonzo J Drummond, of same place, for plate-holder for photographic cameras.

Israel S. Love, Beloit, Wis., improvement in harvesters.

Andrew W. Putnam, Brooklyn, improvement in machinery for cleaning wool.

Owen Redmond, Rochester, improved sash lock.

Charles C. Reinhardt, Baltimore, improvement in glass or earthen truss pads.

Chas. Spofford, Amesbury, Mass., improved machina for cutting irregular forms.

Caleb O. Walworth, Boston, improved machine for finishing gas-pipe fittings.

Wm. E. Ward, Port Chester, improvement in nut-machines.

Caleb C. Walworth, Boston, improved vise.

Geo Ichabod Washburn and Ephraim H. Bellows, Worcester, improvement in brick machines.

Alex. J. Walker, New-York, improved bracket for door springs.

Wm. B. Wood, Fitchburgh, improved hoop machine.

Benj. F. Sturtevant, Skowhegan, Me., assignor to Elmer Townsend, of Boston, improvement in pincers for lasting boots and shoes.

Milton D. Whipple, Charlestown, assignor to A. B. Ely, of Newton, Mass., improvement in cutting round files.

Wm. P. Coleman, New-Orleans, improvement in millstone dress.

Carlos French, Seymour, Ct., improvement in coiled springs for railroad cars.

Pliny E. Chase, Philadelphia, arrangement of means for regulating the draught of steam boilers.

Lydia Atwood and C. O. Crosby, administrators of Chas. Atwood, deceased, New-York, improvement in sticking pins in paper.

Otis Avery, Bethany, Pa., improvement in guides for working button holes.

Baalam G. Anderson, Chillicothe, Ohio, improved canal bridge.

Lydia Atwood and C. O. Crosby, administrators of Chas. Atwood, deceased, late of New-York, improvement in papering pins.

J. Bourbin, San Francisco, improvement in excavators.

J. W. Barnes, Murfreesboro', improved manure distributor.

Walker B. Batram, Waterbury, Ct., improvement in sticking pins in paper.

W. T. Barnes, Buffalo, and Jacob Barnes, Oakville, C. W., improved pump.

Joel W. Cormack and Ferdinand C. Walker, Quincy, Ill., improvement in grain separators.

David P. Estep, Pittsburgh, improvement in making axe poles.

Dennis E. Fenn, Tallmadge, Ohio, improved method of opening and closing farm gates.

Carlos W. Glover, Roxbury, Ct., improvement in harvesters.

Dorminico Giambastiana, Washington, D. C., firemen's ladder.

James L. Humphrey, Syracuse, improvement in salt evaporators.

M. G. Hubbard, Penn Yan, improved arrangement of springs for side-spar wagons.

James Kelly, Sag Harbor, improvement in antifriction bushing for ships' blocks.

Samuel A. Knox, Worcester, improvement in ploughs.

Edwin T. Ligon, Richmond, Va., improvement in pumps.

John J. Mozart, Xenia, Ohio, improvement in escapement movements for automatic fans.

John H. More, West Troy, improved method of hanging reciprocated saws.

Jno. L. Mason, Germantown, improvement in porte monnaies.

Jno. North, Middletown, Ct., improvement in sawing stone.

Sam'l. C. Norcross, Dixfield, Me., improved adjustable stirrup for saw-mill pitmen.

Chas. Pawling, New-Pitsburgh, Ohio, improvement in bee hives.

Jacob Purkey, York, Pa., improvement in washing machines.

Samuel W. Pingree, Methuen, Mass., improvement in the order of applying tan liquor to hides.

Wm. Provines, Columbia, Mo., improvement in uterine supporters.

Lodner D. Phillips, Chicago, improvement in submarine exploring armors.

James Perkins and Wm. H. Burnet, Newark, N. J., improved machine for bending metal pipe.

Chas. Schroder, New-York, improvement in spring bed bottoms.

John Sitton, Williamston, S. C., improved wheelwrights' machine.

Philos B. Tyler, Springfield, Mass., improvement in finishing castor wheels for furniture.

James S. Taylor, Danbur, improvement in machinery for forming hat bodies.

John L. Tuttle, New-York, improvement in manufacturing cylinders for cotton gins and machine cards.

John L. Tuttle, New-York, improvement in card teeth for machine cases.

Guillaume H. Talbot, Boston, Mass., improvement in gimlet handles.

Noah Warlick, Lafayette, Ala., improved arrangement of the thills of vehicles.

John C. Ward, Charleston, S. C., improvement in railroad car coupling.

Perry A. Wilbur, New-Castle, Pa., improvement in nail machines.

S. Young, Milton, N. Y., improved fastening for gates.

Stephen A. Whipple, Shaftsburg, Vt., and Herman Whipple, Port Richmond, N. Y., improved machine for cleaning emery wheels.

Simon Ingersoll, Greenpoint, N. Y., assignor to Farmers' and Mechanics' Manufacturing Co., same place, improved method of felling trees.

Thos. Dutton, Washington, D. C., assignor to John R. Elvans, same place, improved brace for carriage springs.

Alfred P. Critchlow, Florence, Mass., assignor to A. P. Critchlow & Co., same place, hinge for picture cases.

Thos. W. Chatfield, Utica, improved chimney cowl.

John Barnes, Mount Morris, N. Y., thrashing and separating machines.

Chas. R. Belt, Washington, D. C., cotton seed planters.

Edmund C. Bills, Jr., Perry, N. Y., cleaning coulters of ploughs.

Wm. Black, Alleghany City, Pa., corn shellers.

John P. Cowing, Seneca Falls, N. Y., pumps.

J. C. Briggs, Woodbury, Ct., reed for musical instruments.

Daniel Freeman, Burford, Canada, carriages.

Victor M. Griswold, Lancaster, Ohio, photographic pictures.

Alex. Le Mat, New-Orleans, La., fire-arm.

Pells Manny, Waddams Grove, Ill., sickles for harvesters.

Pells Manny, Waddams Grove, Ill., harvesters.

C. A. McPhetridge, St. Louis, Mo., spike machine.

Joseph McCraken, Brooklyn, N. Y., sizing hat bodies.

James B. Mell, Ricehoro', Ga., cotton gins.

W. F. & C. J. Prevost, Selma, Ala., cotton presses.

John Moore, Madison, Ind., screw machine.

Chas. Perley, New-York city, ships' capstans.

Perry A. Wilbur, Newcastle, Pa., nail plate feeding.

Henry D. Pochin, Salford, Eng., preparing clay for alum making. Patented in England, Jan. 30, 1855.

John M. Sigourney, Watertown, N. Y., cast-iron railroad car wheels.

Abbey S. Smith, Rochester, N. Y., scale for instrumental music.

C. A. Mills, Dubuque, Iowa, head rests for chairs.

Walter Worthen, Danville, N. H., balance and fastener for window sash.

H. R. Howlet, assignor to himself and A. W. Goodell, New-York city, filing and setting saws.

S. S. Turner, Lewiston, Me., assignor to himself and Elner Townsend, Boston, Mass., splitting mackerel.

J. J. Bate, Brooklyn, N. Y., lard rendering kettles.

Chas. Baum, Philadelphia, Pa., combined table and bedsteads.

Thomas Blanchard, Boston, Mass., bending wood.

A. A. Dailey, Wilson, N. Y., washing machines.

Edward Gleason, Dorchester, Mass., bottle casters.

J. H. Howell, Ansonia Ct., India rubber hose.

Tony Petitjean, Tottenham Court Road, Eng., silvering mirrors.

Jas. M. Kern, Morgantown, Va., washing machine.

Augustus Pfaltry, Saxonville, Mass., rosin soaps.

Samuel Pierce, Troy, N. Y., cooking stoves.

Joseph Poleux, New-York City, coating metals with metals.

John Schaffer, Manchester, Pa., capstans for steamboats.

J. H. Shireman, East Berlin, Pa., seed planters.

Wm. Thomas, Jr., Bingham, Mass., stove blacking.

George Thompson, East Tarentum, Pa., putting up caustic alkalies.

C. N. Tyler, assignor to Henry Pardin, Washington, D. C., washing machines.

J. P Derby, assignor to the Salisbury Manufacturing Co., Amesbury, Mass., dyeing.

J. V. Jenkins, Jackson, Miss., shearing sheep.

Robert P. Bradley, Cuyahoga Falls, improved puppet valve.

Edward C. Blakeslee, Enoch Platt, Jr., and Edmund Jordan, Waterbury, improved machine for making brass kettles.

Wm. H. Butler, New-York, improvement in locks.

Geo. W. Burling, Trenton, N. J., for improvement in machines for bending sheet metal.

Hazen J. Batchelder, West Fairlee, Vt., for tooth extractor.

Isaac B. Branch, Galena, Ill., apparatus for applying freezing mixtures to the teeth.

Matthew A. Crooker, New-York, arrangement of buckets of paddle-wheels.

Wm. C. Childs, Boston, improvement in mould candle machines.

John B. Coppinger, New-York, for method of fastening jewelry.

Plumer Chesley, Candia, N. H., for improved current wheel.

John W. H. Doubler, Stephenson county, Ill., for improvement in cooking stoves.

John Anthony, Gaussardia, Washington, D. C., for method of preserving dead bodies.

Chas. A. Howard, Pontiac, for gas generator.

Jesse D. Havis, Perry, Ga., improvement in seed planters.

John R. Hopkins, Auburn, improvement in evaporators for salts.

Reuben M. Hine, Troopsville, improvement in the handles of agricultural forks, shovels and hoes.

George E. W. Herbert, Cohoes, improved water wheel.

Harvey B. Ingham, Camptown, Pa., improvement in smut machines. Ante-dated June 24, 1856.

Wm. S. Lord, Pulaski, Tenn., improved perch coupling for carriages.

Geo. C. Lawrence, Winchester, Mass., improvement in soap mixtures.

Josiah Mumford and Jno. W. Wilson, Clarksburg, Ohio, improvement in washing machines.

Jos. C. Moulton, Fitchburg, Mass., improvement in suspension hook and insect insulator.

John Phyfe, New-York, for ivory bleaching apparatus.

S. T. Savage, Albany, improvement in stoves and furnaces.

Wm. Smith, Newport, R. I., improvement in machines for husking corn.

James M. Thompson, Holyoke, improvement in oil cans.

Wm. B. Twiford, Horntown, Va., for improved dumping wagon.

Wm. H. Triesler and Jno. Stewart, Fairview, Pa., improved mode of securing sheet metal covering for roofs.

Moses D. Wells, Morgantown, Va., improvement in washing machines.

Thornton A. Washington, United States Army, improvement in breech-loading fire-arms.

Wm. Wentzs, Geneva, improvement in shaft tugs.

John Wilcox, Philadelphia, improvement in metallic pens.

Noah Warlick, Chambers Co., Ala., improved back-hand hook for plough harness.

Wm. P. Carpenter, Brooklyn, improvement in billiard-table cushions.

Geo. W. Morse, Baton Rouge, improvement in cartridges.

D. Lynahon and C. J. Wing, Buffalo, assignors to D. Lynahon, aforesaid, improvement in railroad car coupling.

Henry Forstrick, Hoboken, improvement in working over vulcanized India rubber.

John B. Read, Tuscaloosa, improved projectile for ordnance.

AGENTS FOR THIS JOURNAL

Are as follows: and no other names are recognized, as such, at this office.

S. D. Allen, Moore and Atkins, Paul A. Davis, in the Northern and Middle States; James Deering and Henry M. Lewis, in the Southern States.